



FRIDAY, FEBRUARY 27.

## Train Accidents in January.

The following accidents are included in our record for the month of January:

## COLLISIONS.

## REAR.

1st, a. m., freight train on Detroit, Mackinac & Marquette broke in two near Rock River, Mich., and rear section ran into forward one, damaging several cars; 2 passengers in the caboose were hurt.

1st, night, freight on New York Central & Hudson River ran into preceding freight in Lyons, N. Y., doing some damage.

4th, night, passenger train on Philadelphia & Reading ran into rear of freight near Mt. Carbon, Pa., wrecking 3 cars.

5th, night, freight on Chicago, Burlington & Quincy ran into some cars broken loose from preceding freight, near Galesburg, Ill., wrecking several cars.

9th, p. m., passenger train on New York Central & Hudson River ran into freight near Fairport, N. Y., wrecking several cars. The passenger was running on the freight tracks on account of snow.

10th, early, freight on St. Louis, Iron Mountain & Southern ran into cars broken loose from preceding freight, near Mine La Motte, Mo., wrecking several cars, injuring fireman and a brakeman.

10th, a. m., freight on Pensacola & Atlantic ran into a sleeping car which had broken loose from a passenger train, near Bonifay, Fla. The car was badly damaged; the conductor and 5 passengers hurt.

10th, a. m., some cars of a coal train on New York, Lake Erie & Western, which had just been run on a high siding in Paterson, N. J., started on account of the breaking of a brake chain and ran down on the main track and into the rear of the train which had put them on the siding. Some 20 cars were piled up in a bad wreck.

13th, a. m., freight on Bennington & Rutland ran into preceding freight in Manchester, Vt. A fireman was hurt.

14th, a. m., freight on Kankakee & Seneca ran into preceding freight near Kankakee, Ill., wrecking 4 cars and injuring passenger in caboose.

15th, p. m., coal train on Tioga road ran into freight at Covington, Pa., wrecking 2 cars.

16th, night, Chicago & Alton west-bound train ran into east-bound passenger train stopping at Higginsville, Mo., for water, and three engines were badly wrecked. An engineer was killed.

18th, early, passenger train on Wabash, St. Louis & Pacific ran into another passenger train, which had stopped at Sidney, Ill., wrecking 2 cars.

18th, a. m., passenger train on Fitchburg road ran into preceding passenger train in the yard in Boston, wrecking a car.

19th, a. m., passenger train on Central Pacific ran into rear of a freight near Byron, Cal., wrecking several cars. There was a dense fog at the time.

19th, a. m., freight on Utah & Northern ran into another freight, which was switching at Beaver Cañon, Idaho, and three engines were wrecked. It was snowing very hard at the time and signals could not be seen.

22d, a. m., freight on Baltimore & Ohio broke in two near Glencoe, O., and rear section ran into forward one, wrecking several cars.

24th, a. m., freight on Louisville & Nashville ran into preceding freight near Pollard, Ala., wrecking 4 cars.

25th, night, engine on Indiana, Illinois & Iowa, which had been sent out to bring in a freight train abandoned in the snow near Budd, Ill., ran into the train, wrecking several cars.

26th, a. m., freight on St. Paul & Duluth ran into preceding freight, near Hinckley, Minn., wrecking caboose and killing a brakeman.

26th, night, passenger train on Wabash, St. Louis & Pacific ran into freight stuck in a snow-bank, near Corydon, Ia., wrecking engine and killing fireman.

26th, night, freight on Louisville & Nashville broke in two near Columbia, Tenn., and rear section ran into forward one, wrecking several cars and injuring a brakeman.

27th, night, freight on New York Central & Hudson River ran over a misplaced switch and into freight standing on siding at Palatine Bridge, N. Y., wrecking engine and 16 cars.

28th, a. m., freight on Marquette, Houghton & Ontonagon road ran into another freight standing at water tank, at L'Anse, Mich., wrecking both engines and 2 cars. The freight was descending a grade and got beyond control, the track being very slippery and the brakes failing to hold.

28th, p. m., passenger train on New Brunswick road ran into preceding passenger train stalled in a snow-bank, near Rushagornis, N. B., wrecking a car and injuring conductor.

29th, early, passenger train on Wabash, St. Louis & Pacific ran into preceding passenger near St. Charles, Mo., damaging a car and injuring conductor.

29th, a. m., freight on Illinois Central ran into preceding freight, near La Salle, Ill., damaging caboose and injuring a brakeman.

29th, p. m., passenger train on Intercolonial road ran into rear of a freight stalled in a snow-drift near Assametsquahan, N. B., wrecking several cars.

31st, night, freight on Lake Erie & Western ran into preceding freight, near Fremont, O., wrecking engine and 6 cars.

## BUTTING.

4th, night, butting collision between two freight trains on Utah & Northern near Big Hole, Mont., wrecked both engines and killed a fireman.

6th, a. m., butting collision between two freights on St. Louis, Iron Mountain & Southern, near Cadet, Mo., wrecked both engines and 20 cars, and injured 3 trainmen.

9th, night, coal train on New Jersey Central ran over a misplaced switch into another coal train going in the opposite direction on the other track, near Phillipsburg, N. J. Both engines and 20 cars were wrecked.

10th, early, butting collision between two freight trains on Chesapeake & Ohio, near Low Moor, W. Va., wrecked both engines, killed engineer and fireman and injured 3 other trainmen. It is said that the accident was caused by mistake of the telegraph operator, who was a boy only 14 years old.

16th, night, butting collision between freights on New York, Pennsylvania & Ohio, near Akron, O., wrecked both engines and several cars and injured a brakeman.

19th, night, butting collision between two freights on Chicago & Northwestern, near Belle Plain, Ia., wrecked both engines and several cars.

20th, a. m., butting collision between two freights on New York, Chicago & St. Louis, near Grand Crossing, Ill., wrecked 3 engines and killed engineer.

24th, a. m., butting collision between freight and repair

train on Grand Rapids & Indiana road, at Cadillac, Mich., wrecked both engines.

25th, midnight, butting collision between two freights on Pittsburgh, Cincinnati & St. Louis, near Colliers, W. Va., wrecked both engines and 9 cars.

27th, night, butting collision between freight and wild engine on Baltimore & Ohio, near Quincy, W. Va., wrecked both engines, killing 2 trainmen and injuring 2 others.

28th, a. m., butting collision between freight train and snow-plow on Oregon Short Line, near Huntington, Ore., wrecked both engines, killed a fireman and the road-master, who was on the plow, and injured the engineer.

29th, early, butting collision between passenger and freight train on Central Vermont, near Bethel, Vt., damaged both engines and several cars.

30th, a. m., freight on Chicago, Burlington & Quincy broke in two near Ottawa, Ill., and the detached cars ran back down grade and into the head of a following freight. Engine and 3 cars were badly damaged.

31st, a. m., butting collision between passenger and freight train on the Chicago & Grand Trunk road, in Chicago, damaged both engines.

## CROSSING.

1st, night, Ogdensburg passenger train on Central Vermont ran into Montreal passenger at the crossing of the two lines at Swanton, Vt. Both engines were badly damaged.

15th, a. m., freight train on Lake Shore & Michigan Southern ran into New York, Lake Erie & Western freight at crossing in Buffalo, N. Y. The Erie engine was thrown over and badly damaged. It is charged that neither train stopped before approaching the crossing.

25th, night, Ohio & Mississippi freight ran into Jeffersonville, Madison & Indianapolis freight at the crossing in Jeffersonville, Ind., doing some damage.

28th, night, freight on Wabash, St. Louis & Pacific ran into St. Louis & Cairo passenger train at the crossing at Cairo, Ill., throwing over a car and injuring 2 passengers slightly.

## DERAILMENTS.

## BROKEN RAIL.

1st, a. m., passenger train on Central Branch road was thrown from the track near Netawaka, Kan., by broken rail, and one trainman hurt.

3d, a. m., passenger train on New York & Greenwood Lake road was thrown from the track near Montclair, N. J., by broken rail.

5th, p. m., passenger train on Indiana, Bloomington & Western struck a broken rail near Tilly, Ind., and 3 cars were derailed; one upset and another ran into a field 40 ft. from the track. A passenger was badly hurt.

6th, a. m., freight engine on Chicago, Burlington & Quincy was derailed at Pomer Junction, Ill., by broken rail.

12th, a. m., passenger train on Wabash, St. Louis & Pacific struck a broken rail near Venice, Ill., wrecking engine and 3 cars. Express messenger was badly, and 5 passengers slightly hurt.

13th, p. m., passenger train on Vicksburg & Meridian was thrown from the track near Brandon, Miss., by broken rail.

14th, a. m., freight train on Annapolis & Elk Ridge road was thrown from the track near Dorsey, Md., by broken rail.

15th, night, freight on Hannibal & St. Joseph was thrown from the track at Brookfield, Mo., by broken rail, and 13 cars were wrecked. A man standing near the track was caught under the wreck and killed.

16th, p. m., freight on Kansas City, St. Joseph & Council Bluffs was thrown from the track near Mound City, Mo., by a broken rail, and 3 trainmen were hurt.

16th, night, passenger on Missouri Pacific was derailed at Concordia, Mo., by broken rail.

17th, noon, engine of passenger train on Grand Trunk was thrown from the track at Norway, Me., by broken rail and 2 passengers riding on the engine were badly scalded.

19th, a. m., passenger train on Chicago, Milwaukee & St. Paul struck a broken rail near Mauston, Wis., and 2 cars were derailed.

21st, early, passenger train on Missouri Pacific struck a broken rail near Sedalia, Mo., and sleeping car was derailed and rolled down a bank, injuring 3 trainmen and 6 passengers.

22d, a. m., freight on Chicago, Milwaukee & St. Paul was thrown from the track at Oakdale, Wis., by broken rail.

22d, night, passenger train on Wabash, St. Louis & Pacific was derailed at Sublett, Mo., by broken rail and 5 passengers were slightly hurt.

23d, night, passenger train on the Wabash, St. Louis & Pacific was derailed near Edwardsville, Ill., by broken rail and 4 trainmen were hurt.

24th, a. m., freight on Burlington, Cedar Rapids & Northern was thrown from the track near Waterloo, Ia., by broken rail. A brakeman was hurt.

24th, a. m., passenger train on Western Railroad, of Alabama, struck a broken rail near Opelika, Ala., and 3 cars were thrown from the track.

26th, p. m., freight on New Brunswick road was derailed near Presque Isle, Me., by broken rail.

27th, night, freight on Chicago & Northwestern was thrown from the track by broken rail near Elmhurst, Wis.

28th, a. m., passenger train on Chicago, Milwaukee & St. Paul was thrown from the track by a broken rail near New Hampton, Ia., and 5 passengers slightly hurt.

28th, p. m., passenger train on Chicago, Milwaukee & St. Paul was thrown from the track near Albany, Ill., by broken rail.

29th, a. m., passenger train on Lake Erie & Western struck a broken rail near Saybrook, Ill., and 3 cars were derailed, injuring 5 passengers slightly.

## BROKEN FROG.

9th, a. m., freight on Cincinnati, Wabash & Michigan was thrown from the track at Urbana, Ind., by a broken frog.

## BROKEN SWITCH-ROD.

5th, a. m., freight on Louisville, New Albany & Chicago was derailed by broken switch-rod at Lancaster, Ind., and 21 cars were wrecked.

10th, a. m., engine and 3 cars of freight on Chicago, St. Louis & Pittsburgh were derailed at Summit, O., by broken switch-rod. Engine upset, killing engineer and injuring fireman and brakeman.

17th, evening, passenger train on Wabash, St. Louis & Pacific was derailed at Millville, Ill., by broken switch-rod. Engineer and fireman badly hurt.

18th, a. m., freight train on Chicago, Burlington & Quincy was derailed at Galva, Ill., by broken switch-rod.

22d, a. m., freight on Pennsylvania Railroad was derailed near Safe Harbor, Pa., by broken switch-rod.

25th, night, 4 cars of passenger train on Chicago & West Michigan were derailed near Dunning, Mich., by broken switch-rod, and 4 passengers were hurt.

## BROKEN BRIDGE.

18th, a. m., freight on Chicago, St. Louis & Western broke through a bridge near Roanoke, Ill., and engine and 2 cars went down, injuring a brakeman.

26th, a. m., freight train on Missouri Pacific broke through bridge near Isabel, Mo., and was wrecked.

## SPREADING OF RAILS.

8th, evening, passenger train on Bellaire, Zanesville & Cincinnati was derailed near Bethel, O., by the rails spreading.

20th, noon, passenger train on Ohio & Mississippi was derailed on a trestle near Fairfield, Ill., by the spreading of rails, and a car fell 12 ft. to the ground, injuring 6 passengers badly, 2 trainmen and 12 passengers slightly.

21st, evening, 3 cars of freight on Ohio River road were derailed at Hog Narrows, W. Va., by spreading of the rails.

23d, a. m., passenger train on the Texas & St. Louis was thrown from the track near Gilmer, Tex., by spreading of the rails. A passenger was killed.

23d p. m., passenger train on Syracuse, Ontario & New York was derailed in East Syracuse, N. Y., by spreading of the rails. A car was upset and 7 passengers slightly hurt.

23d, night, freight on Gulf, Colorado & Santa Fe was derailed near Cleburne, Tex., by spreading of the rails.

## BROKEN WHEEL.

3d, a. m., freight train on Pennsylvania Railroad was derailed at Holmesburg Junction, Pa., by broken wheel.

13th, a. m., passenger train on Allegheny Valley was derailed at Shippers, Pa., by a broken wheel in engine truck.

13th, a. m., freight on Norfolk & Western was thrown from the track near Petersburg, Va., by broken wheel. Conductor was badly bruised, but managed to flag a following train in time to prevent serious damage.

28th, night, a car of a passenger train on New York, Lake Erie & Western was derailed near Lordville, N. Y., by broken wheel.

29th, a. m., passenger train on St. Paul & Duluth road was derailed near Duluth, Minn., by broken wheel.

## BROKEN AXLE.

1st, p. m., passenger train on Central Branch road was derailed near Scandia, Kan., by broken axle. Brakeman and 3 passengers hurt.

24th, early, passenger train on Canadian Pacific was thrown from the track at Smith's Falls, Ont., by broken axle. Baggage-master and a passenger were killed and 6 passengers hurt.

## BROKEN TRUCK.

13th, night, 5 cars of freight on New York, Lake Erie & Western were thrown from the track near Tip Top, N. Y., by broken truck.

29th, night, freight on Pennsylvania Railroad was derailed at Collins, Pa., by broken truck.

31st, a. m., several cars of freight on Pittsburgh, Ft. Wayne & Chicago were derailed near Alliance, O., by broken truck.

## DROPPED BRAKE-BEAM.

30th, a. m., second car of a passenger train on New Jersey Central was derailed near Greenville, N. J., and after dragging along on the ties nearly a mile, was thrown from the track altogether, dragging 3 other cars after it. The cars were thrown over against a coal-train standing on siding, and were almost completely broken up, making a very bad wreck, in which 3 trainmen and 29 passengers were injured, 2 of them fatally. It is thought that the accident was caused by a broken beam under the forward car dropping down and catching in the wheels of the rear truck. A broken wheel was found under the car, but the probability seems to be that it did not cause the accident, but was broken while the car was bumping over the ties. The train was running at a very high rate of speed when the accident occurred.

## ACCIDENTAL OBSTRUCTION.

22d, a. m., a mail bag thrown from mail car on Worcester, Nashua & Rochester, at Groton, Mass., fell under the wheels, throwing the car from the track.

## WASH-OUTS AND LAND-SLIDES.

7th, night, passenger train on Allegheny Valley ran into wash-out near East Sandy, Pa., and engine was thrown into the Allegheny River.

9th, a. m., freight train on New York, West Shore & Buffalo ran into a land-slide at Clearwater, N. Y., throwing engine and 9 cars from the track.

15th, early, freight on Texas & Pacific ran into wash-out near Big Sandy, Tex., and was wrecked.

## WIND.

11th, night, freight train on Louisville & Nashville was blown from the track near Calera, Ala., by a cyclone, the engine being damaged and several cars wrecked.

## SNOW AND ICE.

1st, night, passenger train on Sioux City and Pacific was thrown from the track in a snow-bank near Stanton, Neb., and engine upset.

4th, a. m., 3 cars of freight on New York, Lake Erie & Western were derailed at Howell, N. Y., by ice on the track.

12th, a. m., passenger train on Wabash, St. Louis & Pacific was derailed in a snow-drift near Decatur, Ill., and engineer hurt.

15th, night, passenger train on Illinois Central was derailed in a snow-drift near Storm Lake, Ia., and 3 passengers hurt.

18th, a. m., freight on New York, West Shore & Buffalo was derailed near Fonda, N. Y., by ice wedged down in the track at a crossing.

25th, night, freight train on Cleveland, Columbus, Cincinnati & Indianapolis was derailed near Sidney, O., in a snow-drift.

28th, evening, engine and snow-plow on Illinois Central were derailed near Webster City, Ia., in a snow-drift.

29th, a. m., engine and snow-plow on Oregon Railway & Navigation Co., road ran off the track in a snow-drift, near Huntington, Ore., and went down a high bank. The engineer was badly hurt.

31st, evening, passenger train on Wabash, St. Louis & Pacific was derailed near Petersburg, Ill., in a snow-drift, and 3 passengers slightly hurt.

## MISPLACED SWITCH.

1st, a. m., passenger train on Wabash, St. Louis & Pacific was derailed near Ft. Wayne, Ind., by a misplaced switch. Engineer slightly hurt.

5th, a. m., freight on Philadelphia & Reading was derailed at Malins, Pa., by misplaced switch.

13th, p. m., freight on Delaware & Hudson Canal Co. road was derailed at Ft. Edward, N. Y., by misplaced switch.

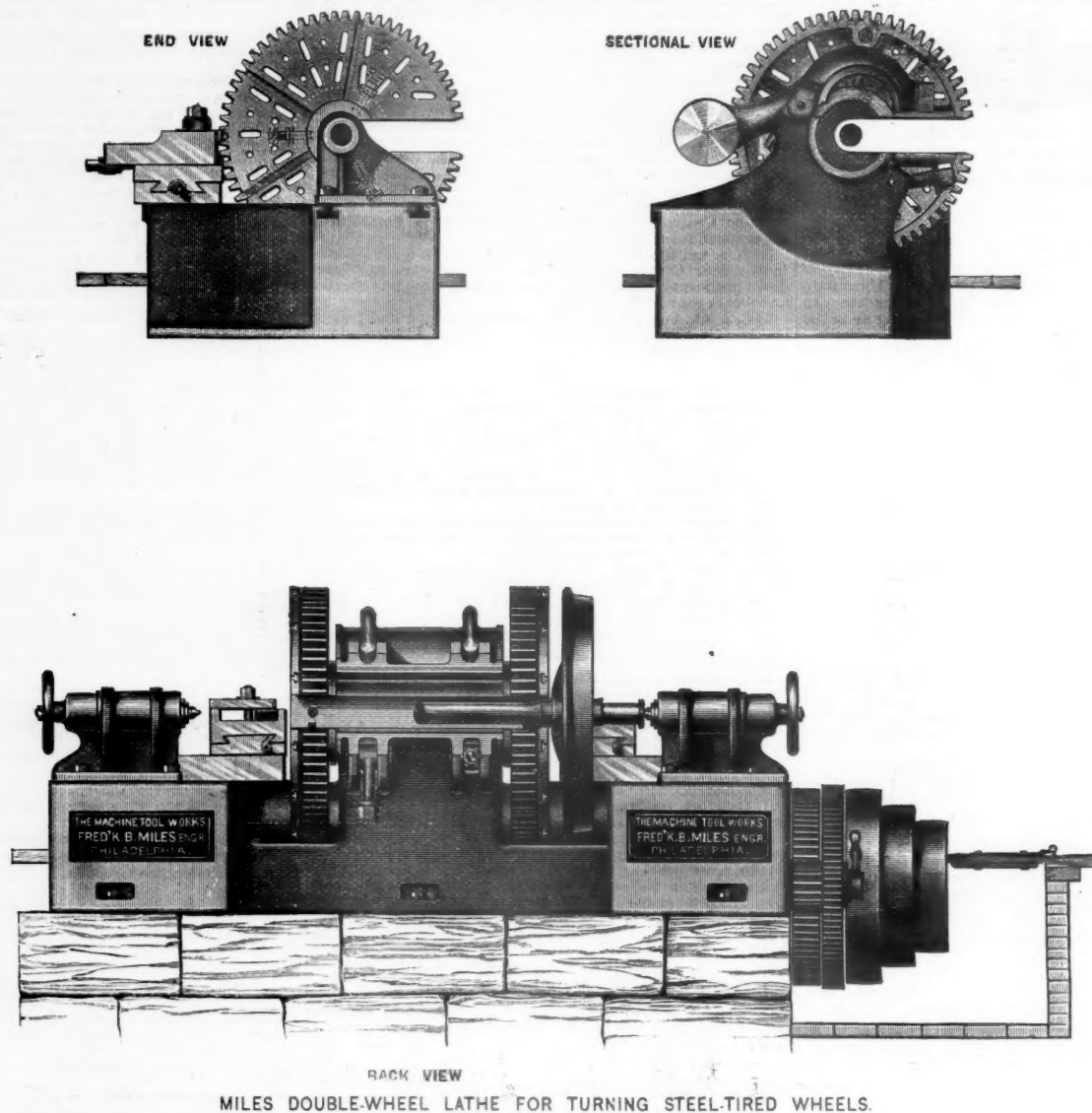
15th, p. m., passenger train on Lehigh Valley ran over misplaced switch at Stony Creek, Pa., upon a siding and went off the end of siding down into the creek. The fireman was killed and engineer badly hurt.

19th, evening, passenger train on Pittsburgh & Lake Erie was thrown from the track in Pittsburgh, Pa., by a misplaced switch. The engine was thrown over against a building near the track, knocking it down.

22d, night, freight on Wabash, St. Louis & Pacific was derailed in Hannibal, Mo., by misplaced switch.

24th, a. m., passenger train on Philadelphia & Reading ran over a misplaced switch at Manayunk, Pa., and upon a trestle siding. The train ran along the siding, off the end of the trestle, and the locomotive fell about 20 ft., with the first car standing upon one end on top of it. The engineer and fire-





MILES DOUBLE-WHEEL LATHE FOR TURNING STEEL-TIRED WHEELS.

men were hurt, but none of the passengers suffered more than slight bruises.

26th, evening, freight on New York, Lake Erie & Western was derailed in Binghamton, N. Y., by misplaced switch.

31st, night, freight on New York, Lake Erie & Western was thrown from the track at Olean, N. Y., by misplaced switch.

#### MALICIOUSLY CAUSED.

1st, very early, passenger train on Baltimore & Ohio was thrown from track near Grafton, W. Va., by a piece of rail jammed down between the main and guard rails, evidently by train-wreckers. The engine and two cars were wrecked, engineer and fireman killed, brakeman and 6 passengers hurt.

8th, evening, passenger train on Long Island road was derailed at Bethpage Junction, N. Y., by switch which had been purposely misplaced. The engine upset, killing the engineer and injuring the fireman fatally.

8th, night, coal train on New Jersey Central was thrown from the track, near Phillipsburg, N. J., by a switch which had been purposely misplaced.

31st, night, freight on New York, Lake Erie & Western was derailed in Corning, N. Y., by a purposely misplaced switch.

#### UNEXPLAINED.

1st, a. m., passenger train on St. Louis & San Francisco was derailed, near Halstead, Kan., and postal car was burnt.

1st, a. m., several cars of freight on Missouri Pacific were derailed near Butler, Mo., and wrecked.

2d, a. m., freight on Long Island road ran off the track near Pearsall, N. Y., and 2 trainmen were hurt.

10th, p. m., 13 cars of freight on Atchison, Topeka & Santa Fe were derailed near Santa Fe, N. M. A brakeman and 2 tramps stealing a ride were hurt.

12th, a. m., freight on Louisville, New Orleans & Texas was derailed on trestle near Vicksburg, Miss., and 4 cars went off the trestle into the water.

13th, p. m., switching freight train on Elmira, Cortland & Northern was derailed in Canastota, N. Y., and 10 cars were wrecked.

14th, p. m., freight train on Allegheny Valley ran off the track near Boston, Pa.

20th, night, freight on Kansas City, Ft. Scott & Gulf was derailed near Kansas City, Mo. A tramp stealing a ride was killed.

21st, very early, freight train on Missouri Pacific was derailed at Rock Creek, Mo., and 9 cars wrecked.

21st, evening, freight on Chicago & Alton ran off the track near Cedar City, Mo.

22d, a. m., freight train on Missouri Pacific was derailed at Rock Creek, Mo., and 5 cars wrecked.

23d, a. m., freight on Western & Atlantic was derailed near Ringgold, Ga., and engine upset.

26th, a. m., engine of freight on Wabash, St. Louis & Pacific was derailed near Waukegan, Ill., and upset, injuring 2 trainmen.

26th, a. m., passenger train on Michigan & Ohio was derailed near Allegan, Mich. A car upset, injuring 4 passengers.

27th, evening, freight on New York, Lake Erie & Western ran off the track in Elmira, N. Y.

27th, night, freight on Union Pacific was derailed at Simpson, Wyo. Caboose upset, killing 1 trainman and injuring another.

#### OTHER ACCIDENTS.

#### BOILER EXPLOSIONS.

17th, early, engine of a freight on Hannibal & St. Joseph road, which had just stopped at Laclede, Mo., exploded its

boiler. The engine was almost completely destroyed. The engineer and fireman were very badly hurt, and 2 trainmen on train standing on siding close by were also badly scalded.

30th, a. m., locomotive of freight train on New York, Lake Erie & Western collapsed 2 flues when near Ramapo, N. Y., disabling engine.

#### BROKEN COUPLING-ROD.

5th, night, engine of passenger train on Virginia Midland road broke a parallel rod when near Brandy Station, Va., and tore up one side of cab, throwing the engineer and fireman back into the tender. The engineer was unable to reach the throttle valve, but managed to cut the air-brake hose, stopping the train in that way.

28th, p. m., engine of passenger train on Connecticut River road broke a coupling-rod when near Smith's Ferry, Mass., and the loose end tore out one side of the cab.

#### MISCELLANEOUS.

21st, early, engine of passenger train on New York, Lake Erie & Western broke tire on one of the drivers when near Cameron Mills, N. Y., and the loose pieces of the tire broke the cab on one side and tore a hole in the boiler.

23d, a. m., passenger train on Chicago & Northwestern was stopped near Baraboo, Wis., by broken truck under a passenger car. The train was stopped in time, and the car did not leave the track. Trains were delayed several hours.

#### SUMMARY.

This is a total of 145 accidents, in which 24 persons were killed and 182 injured; a decrease, as compared with January of last year, of 2 accidents, 32 killed and 58 injured. A fuller statement of the totals and averages will be found on another page.

#### Miles' Double-Wheel Lathe for Turning Steel-Tired Wheels.

The accompanying cuts illustrate a new double-wheel lathe adapted especially to turning steel-tired wheels up to 42 in. in diameter, which has just been brought out by the Machine Tool Works (formerly Ferris & Miles), Frederick B. Miles, Engineer, Twenty-fourth and Wood streets, Philadelphia, Pa.

In this machine, the headstocks and face-plates, instead of being outside the wheels, are placed between them, which is the reverse of the usual method, and the face-plates are made with a gap, as shown in the cut, so as to allow the axles to be rolled freely in and out of the lathe. To facilitate this the heavy cast-iron spindle upon which the face-plates are fastened is also provided with a similar gap; and the headstock bearings, in which it revolves, are provided with a hinged and counterweighted cap, which can be lifted when desired, to allow the wheels and axles to be thus rolled in and out. The driving gear is so arranged that no filling of this gap is required.

The tailstocks are placed upon the outer ends of the machine, and take the centres of the axle in the usual way; or chucks may be adapted to them, by which the axle may run on its own journals as well as on the centres.

The hub of each face-plate is provided with three large steel set-screws, 1½ in. diameter, for grasping the axles close

behind the wheels, and thus doing away with all chatter or vibration. Means are also provided for securing the wheels firmly against the face-plates, so that they may be driven as steadily and powerfully as if they were all one piece with them.

The driving gear is made unusually powerful, in order that the wheels may be turned, without chattering, by means of a broad flat tool, in one cut—somewhat as a chilled roll is turned—after which the flange can be shaped by another tool of proper form.

The bed has gaps to receive the wheels, and its top is brought up to 12 in. below the centres, thus affording a close and solid support to the tool slides, head and tailstocks, etc., which are all of great strength. The tool slides can be moved in to turn the journals when required, and the tailstocks can be moved up to take wheels which have inside journals.

The feed motions are either by hand or automatic, and range from very fine to very coarse. All parts are made simple and strong, so that any intelligent person, though not a mechanic, may soon learn to operate the machine.

To use the lathe to the best advantage, it should be set with centres about 23 in. above the floor, so that 42 in. wheels can be rolled into it on a level, but, if desired, skids may be used.

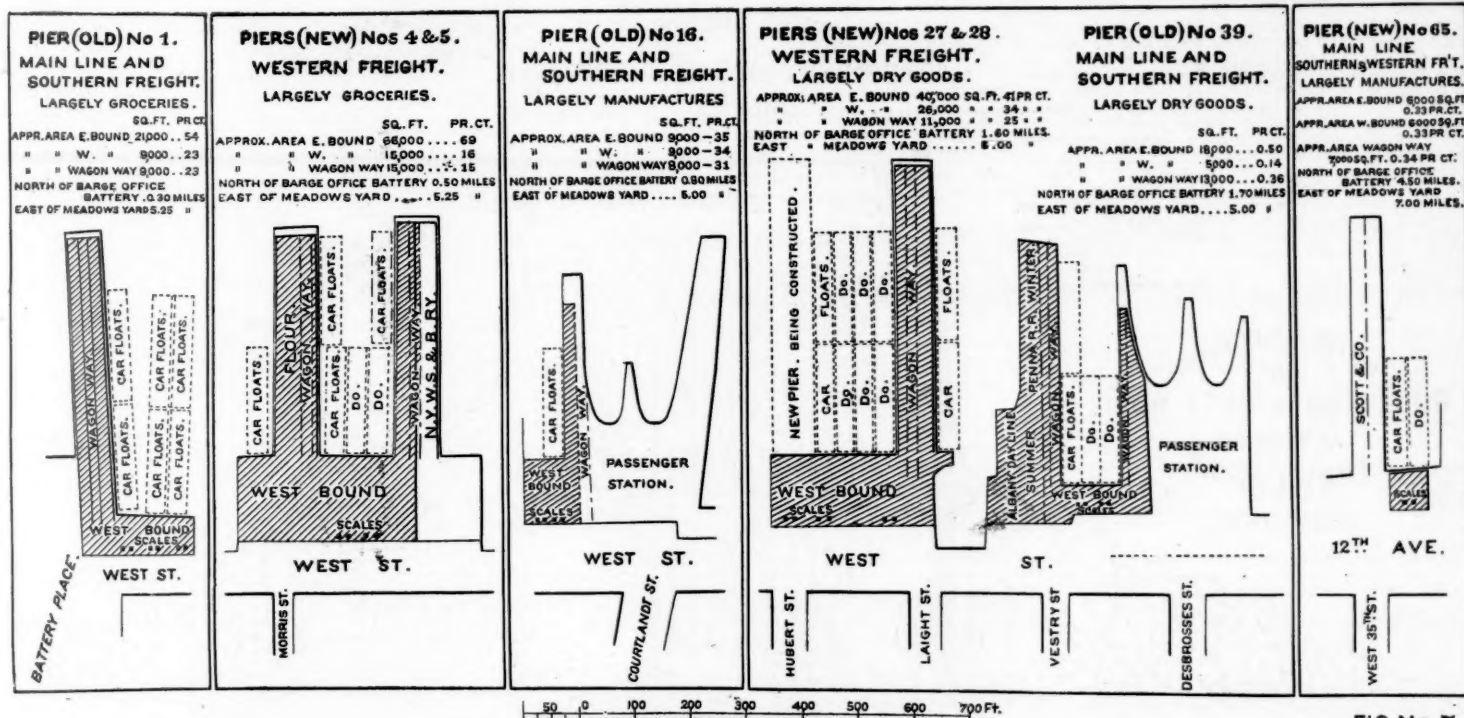
#### Terminal Facilities of the Pennsylvania Railroad at New York.

(Concluded from page 114.)

#### NEW YORK CITY FREIGHT DOCKS.

The Pennsylvania Railroad freight docks, as the accompanying plan (fig. 7) shows, are altogether on the west side of New York, on the Hudson River. As shown, most of them face on West street, which is at present of very irregular width. A general plan has been adopted by the Department of Docks of the city for the improvement of this water front and is prosecuted by that department with as much energy as circumstances permit, and a great improvement has been made within the last ten years. The plan calls for a width of 250 ft. from the east building line of West street to the bulkhead wall, and from this wall piers ranging from 75 to 100 ft. in width extend into the water. It would seem to be impossible to make any decided improvement in the general methods of moving freight in the city before the docks are permanently arranged and constructed and West street opened throughout as designed.

The general arrangement of all the railroad freight docks is the same, but there is no standard, and the unsettled condition of the docks causes many changes in details of construction. The construction of the bulkhead wall is shown in the accompanying plan (fig. 8). The method of construction is as follows: The mud and silt are dredged out to a depth of about 35 ft. below low water, 8 ft. of gravel is then thrown in and protected by riprap thrown on the sides, as is shown,



PENNSYLVANIA RAILROAD—NEW YORK CITY FREIGHT DOCKS.

FIG. No. 7.

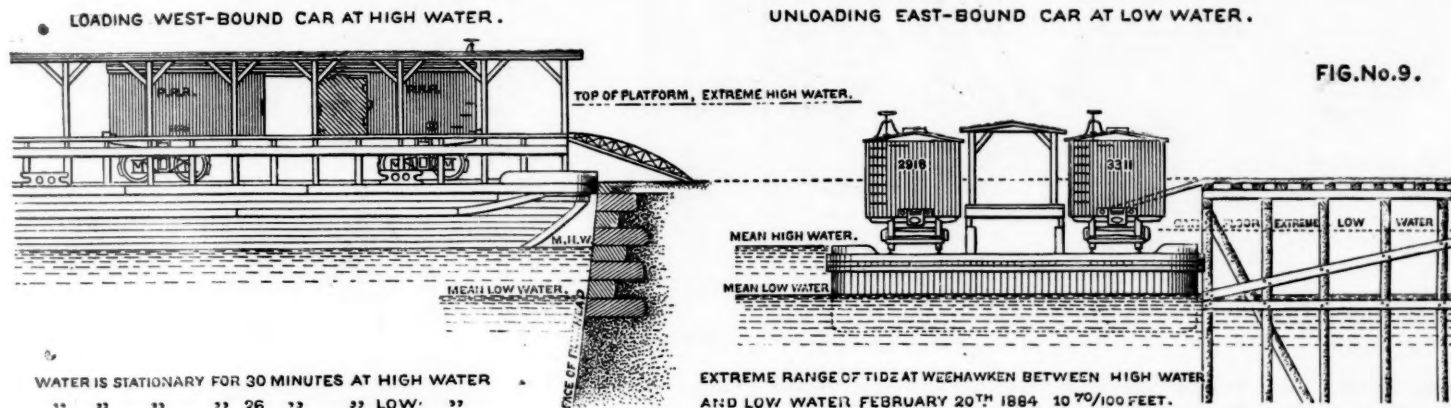


FIG. No. 9.

The piles are then driven and more gravel and riprap thrown between them. Those piles which hold the concrete blocks are sawed off level by a circular saw rigged on a scow. A top dressing of fine gravel is then spread and a "poultice" of cement mortar in gunny bags is then placed on top of each pile, and the concrete block is placed in position by a 100-ton floating derrick, constructed for this service. From this bulkhead wall juts the pier.

Piles can be got 90 ft. long, and even when they are very easily driven, the friction is ample after the settlement of the silt around them.

The concrete blocks are 12 ft. in length longitudinally, are made one part of cement, two parts sand and five parts broken stone. Each block weighs from 70 to 74 tons.

A pier 75 ft. wide, such as is being now constructed on Pier No. 27, has 14 piles (5 ft. 10 in. from centre to centre) in each bent with a brace pile at one end. The first span from the bulkhead is about 16 ft., then 9 ft. spans to within five bents of the end, where the bents are 12½ ft. between the centres. On account of running ice and the exposed position of these outside bents, they are constructed of columns of squared timber 10 in. x 10 in., bolted together, making a cross section of 20 in. x 20 in., shod with an iron shoe and driven by a 6,000-lb. hammer with a 12-ft. fall. They are protected with an iron casing above low water. The bents are capped across the pier and longitudinal stringers, 12 in. x 12 in., drift-bolted on top of the caps, 5 ft. 10 in. between centres. Across the stringers are spiked 4-in. crescented plank, laid 10 in. apart and 3 in. plank spiked over these, laid close together diagonally. A heavy fender is bolted to the piles along the slip. The contract price for removing the old pier and building the new pier No. 27 (shown on fig. 7) was \$40,000. These piers are covered with a one-story warehouse built by the railroad company.

The bulkhead is covered with a frame shed with offices on second story.

**Operation.**—There are no transfer bridges on this side of the river at present in operation by this company, and the general method of handling the freight is by hand-trucking to and from the cars on the floats. On most of the piers are hand derricks for moving heavy freight, but there is no other machinery of any kind, either steam or hydraulic.

The following list gives the general character of business:

#### Main Line and Southern Freight.

Pier 1.—Any quantity of Pennsylvania Railroad and Southern freight, and car loads from Kensington, Pennsylvania.

Pier 16.—Any quantity of New York Division freight and of south-bound Baltimore freight.

Pier 39.—Any quantity of Philadelphia and Pennsylvania Railroad Division and Southern freight, and car-loads only of United New Jersey Division freight.

#### Freight to All Destinations.

Foot of Thirty-fifth street.—Any quantity of main line Southern and Western freight, and car-loads only of lake freight.

#### Western Freight.

Piers 4 and 5.—Any quantity of Western freight and car-loads only of certain stations on the Philadelphia & Erie.

Piers 27 and 28.—Any quantity of Western freight and car-loads only of lake freight.

Approximate work for one day (probably more than the average):

No. of PIER.	Loaded Cars—East-bound.	Cars—West-bound.	No. of Truckmen, Weighmen, etc.
1.....	70	50	80
4 and 5.....	75	50	90
16.....	40	40	40
27 and 28.....	50	50	90
39.....	50	30	125
35th street.....	10	30	25
Total.....	295	335	450
Percentage..	47	53	..

The general method of handling freight is as follows: East-bound freight is trucked from the cars on the float to the pier, and is sorted according to consignees to some extent and piled for temporary storage. The city drays enter from the street and drive along the track marked "wagon way" on the plan (fig. 7), which is simply a part of the pier or which no freight is piled, but on the same level as the rest of the pier, except at Pier 16, where the wagon way is separated from the freight shed, and is on a slightly lower level. The freight is loaded on the drays by outside laborers hired by the draymen and paid generally by the piece. The admission of these wagons on the dock often causes a blockade and inconvenience of work to the railroad men handling the freight. As the sheds are all one-story, this wagon way, as is shown on the plan (fig. 7), occupies approximately 21½ per cent. of the total effective area (considering it as a freight house with a track on the outside), and consequently 21½ per cent. of the annual rental is devoted to this purpose. It is thus found necessary to spend say \$2,000 a month for what would be considered under any other circumstances a very awkward, inefficient arrangement, being simply a series of blind alleys, ranging from 14 ft. to 16 ft. in width and from 500 to 600 ft. in

length. The estimate of area shows, what is very evident by observation, that a wide pier and a deep shed on the bulkhead form the most economical arrangement, giving the greatest relative area for storage, and hence the least relative area for the simple operations of handling freight. This is evident by comparing Piers 4 and 5 with either Pier 1 or Pier 39. The east-bound freight is delivered at all times during the day up to six o'clock. There is no charge made for storage, but if goods remain for some time uncalled for they are sent to some private storehouse.

West-bound freight is unloaded from the city drays into the bulkhead shed, weighed and sorted according to destination if it is not directly loaded upon the cars. The scales are placed in pairs, as shown on the plan. After being sorted and piled the freight is moved on hand trucks from the bulkhead, along the platform on the float, into the cars. The average haul of the hand trucks is say 140 ft. at Piers 4 and 5, and 240 ft. at Piers 27 and 28. The rise and fall of the tide changes the position of the level of the platform, and, as is shown in fig. 9, often requires a heavy lift at a considerable expense of labor. The west-bound freight is received up to 4 p.m. This rule was adopted in order to enable the freight to be shipped promptly each night, and to induce the shippers to forward it during the fore part of the day.

It may be well to note here one instance of the money value of promptness and system in work. As shown by the approximate estimate given (on Fig. 7), 53 per cent. of the number of cars, and probably 50 per cent. of the number of tons, is west-bound freight, and this is handled in 24 per cent. of the total area, and consequently only 24 per cent. of the annual rental, considering it as a freight house, is applied to this movement.

The wages of the truckmen are 17 cents an hour. They generally work 12 hours in the day, as they are often kept loading until 8 p. m. One gang generally loads one car every half hour. The cars are always carefully loaded, so that the first freight to come out is the last to go in.

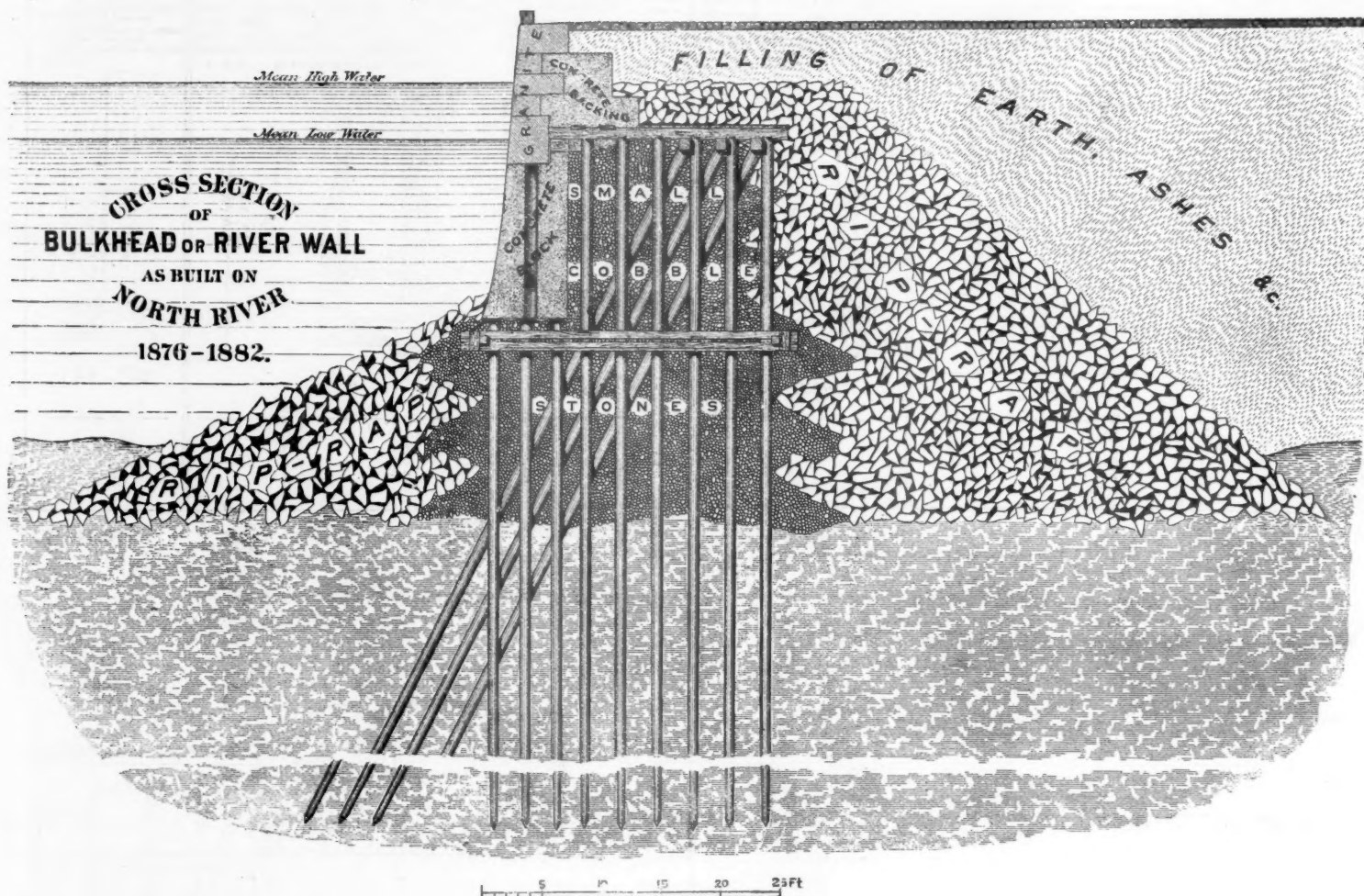
The general organization of the freight stations on this road is similar to the one which we give below, which applies to a freight station on the New York docks: 1 agent and clerks; 1 superintendent of freight house and 1 clerk.

On west-bound freight: 1 weigh-master to each scale; 1 scale clerk to each pair of scales, who records the number and weight of each package; 1 receiving clerk to each pair of scales, who signs the shipping bill, compares and checks it and the duplicate, which is sent to the agent's office. The scale clerk and receiving clerk make entirely separate records and thus form a check on each other. The freight is sorted and piled according to destination by "switchmen," or by



FIG. No. 8.

NEW YORK  
Department of Docks.  
CITY.



ordinary truckmen under the superintendent's directions. Each gang loading the freight consists of nine men, two stevedores, who pack the freight in the cars; five truckmen, who truck the freight; one loader, who loads the trucks; one tallyman, who is stationed at the car and records in a book the number of the car, the names of the stevedores, the date, the time of beginning and ending of the loading of each car, and the consignee, number, weight and contents of each piece. At the fast freight stations, as soon as a car is loaded, the tallyman sends his book to the agent's office, and the pieces are checked with the duplicate shipping bills and the car manifests are made out, and on them the number of the tallyman's book is put.

**On east-bound freight.**—The same gangs are used to unload as to load. The tallyman here also keeps a separate account of each piece on a sheet arranged for the purpose, and sends the sheet to the agent's office as soon as the car is unloaded, where it is compared with the manifest. The delivery clerks, who are stationed at the gate, copy each consignee's bill in a book, and the city drayman receipts in the book, which can be compared with the tallyman's sheets and manifests. It is seen that in this whole system there is a complete series of checks for each man's work, and he is made to feel responsible for it. The system also enables goods to be easily traced.

The force at every freight station is organized into a fire brigade and regularly drilled. Posters are in each building giving the duties and station of each man and the signals; and electric alarm signals are numerous.

#### LIGHTERAGE.

The effective freight lighterage equipment of this company, according to the report of 1883, is:

- 1 freight steamboat on "Eastern" freight.
- 14 tugs. Cost about \$25,000 each.
- 48 car floats (carrying 8 and 10 cars.) Cost \$13,000 each.
- 2 steam lighters.
- 17 lighters.
- 15 barges.
- 8 canal boats.

There is very little hay or dairy products moved on this railroad to New York.

From the report of the Pennsylvania Railroad Company for 1883, the following statistics are obtained of the freight business of the United Railroads in New Jersey Division, being all the New Jersey railroads operated by the Pennsylvania Railroad Company:

Total freight ton-mileage, 1883, 542,827,918.	
Average cost of transporting each ton of freight one mile, 1.167 cents.	
This was made up of conducting transportation.....	\$2,596,927.80
Motive power.....	1,489,446.06
Maintenance of way.....	905,783.49
Maintenance of cars.....	307,152.92
General expenses.....	33,499.27
Total.....	\$6,332,809.54

The following separation is copied or deduced from the report, and is approximately true,

	Freight expenses chargeable to—	
	Hauling.	Handling.
Conducting transportation, conductors and brakemen.....	\$442,598.30	\$50,000.00
Dispatchers, telegraph, etc.....	357,120.11	.....
Car service.....	303,483.99	.....
Labor at stations.....	672,594.54	672,594.54
Agents and clerks.....	475,750.80	475,750.80
Lighterage, docks, etc.....	1,395,389.66	1,205,380.06
Total.....	\$1,193,202.40	\$2,493,755.40
Motive power.....	1,234,241.84	255,204.22
Maintenance of way.....	895,783.49	100,000.00
Maintenance of cars.....	344,152.92	63,000.00
Total.....	\$3,387,380.65	\$2,911,959.62
General expenses.....	.....	33,400.27
Total.....	.....	\$6,332,809.54

This statement shows that, considering the New Jersey railroads as a whole, the work at stations and yards costs nearly as much as the work on the road, and as the terminal work on the New York Division is much larger in proportion than the station and yard work on the other railroads of the system, it is likely that taking this work as a whole the cost of moving a ton of freight between the Meadows yard and the New York city drays is greater than that between the Meadows yard and Philadelphia. It may be possible that this terminal work will hereafter be more completely arranged and concentrated, and that by the introduction of

some simple form of steam machinery for hauling freight longitudinally in the house this work can be done more cheaply than it is at present and quite as promptly.

The conditions to be observed are so various, however, that it is questionable if any mechanical method of moving either east or west-bound freight on these piers can be successfully applied.

The following table is added for easy reference. It gives a comparison of the reports of the New York Central & Hudson River Railroad and the United Railroads of New Jersey Division of the Pennsylvania Railroad for 1883. These roads are double and four-tracked trunk-line railroads entering the port of New York. Each has numerous branches running through a populous country. They differ greatly in the length of line (as is shown), and also in the amount of coal carried, it being only one-fifth of the tonnage of the New York Central to about three-eighths on the United Railroads of New Jersey.

The difference in the proportion of the mileage of branches to main line lessens the value of this comparison, except as between the New Jersey system of the Pennsylvania Railroad and the New York system of the New York Central. The reports are given in such shape that a more just comparison cannot be made. A great deal of the information (as is shown) is derived from estimates and not taken from accurate data, hence it is not intended to be a critical comparison, but simply one which shows the differences in characteristics and business. The statistics of the work of handling would be

#### TERMINAL WORK IN GENERAL.

##### Schedule of Freight Movement at New York Terminus.

Movement.	Main Line and Southern Merchandise.		Western Merchandise.		Grain.	Oil.	Live Stock.	Coal.	
To and from following receiving stations on N. J. shore:	Jersey City Freight Docks.	Harsimus Cove and Red Star and Netherlands Docks.	Harsimus Cove.	Red Star and Netherlands Docks.	Harsimus Cove.	Communi-paw.	Harsimus Cove.	South Amboy.	Harsimus Cove.
Moved by lighters to and from.....	"Stores" and Vessels.	.....	"Stores" and Vessels.	.....	"Stores" and Vessels.	"Stores" and Vessels.	"Stores" and Vessels.	"Stores" and Vessels.	.....
Moved by floats to and from.....	4 N.Y. freight Docks and New England R. R.	.....	3 N.Y. freight Docks and New England R. R.	.....	.....	.....	.....	.....	New England R.R.
Moved on hand trucks to and from.....	Vessels and Lighters.	Vessels and Lighters.	Vessels and Lighters.	Vessels and Lighters.	.....	.....	.....	.....	.....
Moved by gravity or machinery to.....	.....	.....	.....	.....	Vessels and Lighters.	.....	.....	Vessels and Lighters.	.....



better if they could be given per ton handled instead of per ton hauled:

	N. Y. Cen. & H.	U. RR.'s of N. J.
<b>Fixtures:</b>		
1. Miles of main line (c).....	441.75	90.76
2. Miles of road, main line and branches (c).....	903.29	435.07
3. Miles of track (c).....	2,634.88	930.49
4. Miles of track per mile of road (d).....	2.7	2.14
5. Number of city stations (e).....	20	8
<b>Earnings:</b>		
6. Total freight earnings (c).....	\$21,133,766	\$8,269,942
7. Total freight expenses (c).....	15,171,535	6,299,310
8. Net freight earnings (c).....	5,967,231	1,970,632
9. Average total freight earnings per ton-mile (c).....	0.91	1.47
10. Average total freight expenses per ton-mile (c).....	0.68	1.17
11. Average net freight earnings per ton-mile (c).....	0.23	0.30
<b>Tonnage:</b>		
12. Total tons hauled (c).....	10,892,440	8,855,567
13. Total tons of through freight hauled (c).....	1,813,320	2,611,000
14. Total tons of local freight hauled (c).....	9,079,120	6,244,567
15. Per cent. of local freight to total tons hauled (d).....	83	70
16. Average tonnage per mile of road (d).....	2,215,764	1,247,684
17. Average tonnage per mile of track (d).....	820,000	583,000
<b>Mileage:</b>		
18. Average mileage or "haul" per ton, miles (c).....	.902	.613
19. Total ton mileage (c).....	2,200,896,780	542,829,918
20. Total ton mileage of through freight (e).....	725,328,000	234,985,000
21. Total ton mileage of local freight (e).....	1,475,568,780	307,834,918
22. Total hauling expenses (e).....	\$10,226,142	\$3,388,323
23. Per cent. of total expenses (e).....	67 1/2	54
24. Average hauling expenses per ton-mile (e).....	0.43 ct.	0.62 ct.
25. Average hauling expenses per mile of road (e).....	\$10,290	\$7,788
26. Total handling expenses (e).....	4,945,382	2,910,980
27. Per cent. of total expenses (e).....	32 1/2	46
28. Average handling expenses per ton hauled (e).....	\$0.45	\$0.33
29. Average tons hauled per city station.....	544,622	1,106,941
30. New York through freight—		
Cost of handling per ton (e).....	\$0.60	0.60
Average cost of hauling (e).....	2.02	0.53
Average total cost (e).....	2.62	1.13
Average cost per ton-mile (e).....	0.60	1.26
31. Local freight—		
Average cost of handling, all stations (e).....	0.42	0.25
Average cost of hauling (e).....	0.75	0.30
Average total cost (e).....	1.17	0.55
Average length of haul, miles (e).....	164	49
Average cost per ton-mile (e).....	0.71 ct.	1.124 ct.

(c) signifies copied.

(d) "deduced.

(e) "estimated.

Remarks.—Line 4, the difference here is largely caused by the length of "turn-outs" on the New York Central Division.

Line 9.—Water and other competition on the New York Central probably causes this difference.

Line 10.—The relatively large terminal expenses (at New York mostly) on the Pennsylvania causes this difference. See lines 22 and 28.

Line 20.—This is calculated on a basis of 400 miles average haul of through freight on the New York Central, taking into account the Boston freight leaving the road at Albany. This is only used to get the ton-mileage of local freight, line 21.

Line 16.—Shows the equivalent number of tons hauled once over the whole road (main line and branches) and shows that the New York system moves on an average nearly twice the number of tons of freight over every mile of road, and 1.4 the number of tons over every mile of track that the New Jersey system does. See line 17.

Line 25.—Shows the average cost of the work of hauling over a mile of road, and at 5 per cent. interest gives an average value of \$205,800 per mile for the New York system and \$155,760 per mile for the New Jersey system, taking the freight expenses alone as the guide.

Line 28.—This difference is caused by the large proportion of coal hauled on the branches of the Pennsylvania Railroad which does not come to New York, and also by the greater concentration of business (see line 29) caused by the less number of city stations (see line 5), and the same reasons cause the differences shown on line 31.

GRATZ MORDECAI.

## Contributions.

### Track Bolts without Nut-locks.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In a recent number of the *Gazette* you call attention to the fact that some roads do not use nut-locks. If, to your already arduous labors in behalf of railroads, you will add the investigation of this subject, I think you will find that no road with the central bolt-holes of their splice 8 in. apart can do without a nut-lock. So far as I have been able to investigate personally, roads not using nut-locks have the central bolt-holes not over 5 in. apart. I placed a joint with central bolt-holes 8 in. apart in a testing machine. The rail deflected more rapidly than did the plates, showing that the rail, acting as a wedge, forced the upper edge of the plates outwardly before it could force the plates downward. Of course, nut-locks will be necessary on roads with heavy traffic under any circumstances, but the necessity for their use will be much less if the central bolt-holes are brought nearer together. R. R. B.

[The principle of the central bolts close to the joint has been embodied in an interesting and novel standard joint, which we have now engraved for publication, for precisely the reasons specified. In respect to the question of dispensing altogether with nut-locks, we have referred our correspondent's letter to Messrs. Hoopes & Townsend, who have taken a prominent part in the manufacture of accurately cut nuts for this

purpose, from whom we have received the following response.—EDITOR RAILROAD GAZETTE.]

PHILADELPHIA, Feb. 10, 1885.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In reference to details in regard to process of manufacture of track bolts, it is not practicable to give such details except to state, that by the use of improved machinery we thread as many as 20,000 bolts and tap an equal number of nuts to the same standard without losing the gauge of the thread. The thread of each nut will be a complete mechanical fit to that of the bolt.

It is not possible for us to make a practical test of the principle that our track-bolts need no lock to keep the nuts in place, or, at least, it is not possible for us to do so in our own shops. But we state the principle confidently, because these bolts have been in use on a number of railroads for several years, and the testimony of the supervisors and engineers is confirmatory of our claims that properly cut nuts will not loosen by the movements of trains or by the jars incidental to railroad usage.

The Chief Engineer of the Pennsylvania Railroad uses the Verona nut-lock, not to keep the nut in place, as he informs us, but to give elasticity. His opinion is, we believe, that the nuts of our track bolts will not loosen or jar off.

It is hardly possible to show the exactness with which the threads are cut by illustration, but the parted specimens that we send you will show how exact the threads are and how close is the fit of the nut to the bolt. It is not practicable to show this close fit by the use of electros or drawings.

We send a few bolts, such as we are now shipping, and if you will run the nut on the bolt as far as you can with the finger and thumb, you will find that a much greater force is necessary to remove it. But when the nut is forced home by a 12 in. wrench, it will not jar or loosen from its place while in service.

The continued use of these bolts by railroad managers who have once commenced to put them down, is the best evidence we can offer of their efficiency. HOOPES & TOWNSEND.

### Surly Brakemen.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Your article on "Brakemen" in the last issue is pertinent, but do you not think that as the superintendent is so are the brakemen? I have traveled hundreds of thousands of miles over railways in this country, and I never rode on a line that employed surly brakemen but that it seemed to me the superintendent was the party in fault. Some lines are noted for courtesy and comfort, others for boorishness and discomfort. The superintendent is the man to lay hold of for all these troubles, for he is supposed to supervise them.

NEW YORK.

E. P. W.

[Doubtless train-men take their cue from their superior officers; but we had in view not so much positive rudeness as neglect of attentiveness. The superintendent should, indeed, supervise, and enforce good manners as well as discipline. It is, however, not always possible for him to exercise supervision so minutely, because there are too few of him. The division or other superintendent, who is constantly pressed by duties of the most indispensable kind, not only is likely to neglect the enforcement of good manners, but to become rather savage himself. This driving men with work so that they grudge the time necessary to say "thank you" is most destructive of good manners, and it is an exceptional man in whom they survive after a few years of work, in which he must always be thinking of the quickest way to get rid of a visitor.—EDITOR RAILROAD GAZETTE.]

### Freight Car Brakes and Standard Freight Car Trucks.

The last meeting of the Master Car-Builders' Club, held in New York Feb. 19, 1885, President Leander Garey in the chair, was devoted to the discussion of the above subjects.

The Secretary read a communication from the Waldum Electric-Magnetic Brake Co., of Cincinnati, O., pointing out the recognized need for some automatic freight brake. It said that in the United States in 1883 there were 403 rear collisions, 191 butting or head collisions, 39 crossing collisions, and 1 passing collision, a total of 634 collisions. The Ohio Railroad Commissioner says that about one-fourth of the collisions are caused by defects of equipment, and that 81 per cent. of these defects are evidenced in the breaking of trains in two. Of the 440 collisions in Ohio reported directly to the Commissioner in 1883, 79 were from breaking in two.

Damages paid by railroads in Ohio in 1883 were as follows:

Damages on freight and baggage.....\$304,311.84

Injuries to passengers and employees.....232,133.37

Injuries to animals.....163,101.06

Total.....\$699,546.77

For the past 11 years the total in Ohio has averaged \$400,000 per year.

The casualties in Ohio in 1883 were:

Passengers killed.....15 Injured.....114

Employees.....166 ".....677

"Others".....206 ".....202

Total killed.....387 Total injured.....993

In the report for 1882, the Commissioner says that for the past 15 years one person has been injured by railroads in Ohio on an average every 24 hours, and one killed every 42 hours. Of the injured, 10 per cent. have been passengers, 66 per cent. employees and 24 per cent. "others." Of the killed, 7 per cent. have been passengers, 41 per cent. employees and 52 per cent. "others."

In 1882 one person was injured every 10 hours, one killed every 26 hours. The increase is among the employees and "others," the passenger casualties perceptibly decreasing. Since 1882, only 5 per cent. of the injuries and 10 per cent. of the fatalities were to passengers; the injuries to employees, however, forming 71 per cent. of the total injuries. This shows that the passenger service has been made safer propor-

tionately by increased use of improved continuous brakes, putting the train at all times under the control of the engineer. The same thing should be done for freight trains.

Statistics show that the proportion of freight cars to the number of locomotives has increased 50 per cent. within the last eight years, throughout the United States. This increases the danger of breaking in two, and the number of accidents will increase rather than diminish, unless continuous brakes for freight trains shall be adopted.

The Waldum electric brake is a complete continuous brake, and in addition, there can be no separation of the cars to a greater distance than 2 1/4 ft. without sounding bells, and warning both engineer and conductor. The engineer and conductor can also at all times signal each other by the electric bells, avoiding the necessity of conducting the train by hand or lamp signals. Very material improvements have been made within the last two years, and it is meeting the approval of many prominent railroad men. "Buffing" brakes will not do, since they require a crowding together of the cars to act, which is the very thing to be avoided. George Stephenson invented the first one but gave it up as wrong in principles.

Mr. FORD then described his automatic air-brake, illustrating his remarks by diagrams. Comparing the rapidity with which a train could be stopped by his brake and by the Westinghouse brake, Mr. Ford gave the results of some comparative tests made on the Denver & Rio Grande Railway:

Cutting off 5 cars from the Westinghouse train they stopped in 18 seconds, running 180 ft. The Ford-brake cars stopped in 11 seconds and 84 ft. Speed, 17 miles per hour. Grade, 237 ft. per mile down, straight track, dry rail.

Second test, 20 miles per hour. Westinghouse, 16 seconds and 180 ft. Ford, 12 seconds and 132 ft. Westinghouse air-pressure had fallen to 35 lbs.; Ford, remained at 45 lbs.

By placing the air stations along the train, it can be stopped as though it were a single car. We have to have brakemen on the train to operate the brakes, and he did not see why the system proposed was not a step in the right direction.

Mr. FORNEY: I do not think a system of brakes operated by these air stations which must be attended to by the brakemen can be depended upon. In protecting the rear end of trains it is impossible to have the rule observed that a man shall go back to protect the rear of the train when it comes to an unexpected stop. Once when a train stopped unexpectedly, and the brakeman was sent back on the track to signal any approaching train, he went back and waited awhile, but getting tired and sleepy and chilled through, he returned to the train and went to sleep. Soon a train came along, a collision resulted, and the brakeman was killed.

Mr. FORD: In that case you could fall back on the working of the brakes at different stations by some simultaneous action like the electrometer. This, however, would have the effect of complicating the brake system and increasing the cost. My brake will work as well as any other system, however, without relying on the brakeman. The greatest number of cylinders I have operated from one reservoir is 12. I have had only one trial. I should judge I could operate from 30 to 50, depending on the size of cylinder and the amount of air used by the brakes.

Mr. GAREY thought that any brake could only be introduced by slow degrees on the shorter and faster trains, as for express, freight and other special service, where there is not so much mixing up of cars.

Mr. R. M. AGNEW, representing the Rote Automatic Brake Co., of Mansfield, Ohio, considered that the exigencies of freight service required something absolutely automatic, not requiring a connection from car to car, or any special apparatus outside of the car to work it. There are only three sources of power available; the revolution of the wheels or axle, the setting of the car on its springs and the movement of the drawbar. The objections to the use of the first are the difficulty of limiting the application of the power while the revolution of the wheel or axle continues and especially the inexpediency of going to the axle for the power, because it may be broken. As to using the motion of the springs, it is so limited that we seem to be driven to the use of the drawbar for whatever it may be worth.

Mr. GAREY: Are there not certain conditions of grade in which the independent automatic buffer brake is detrimental to the movement of the train? For instance, where you come to the foot of a grade with a very abrupt up grade, as there is on some roads. Could not a part of the train have the brakes on and a part off, and stall the train by making it impossible for the engine to haul the brakes off?

Mr. TALLMAN: In that case, the engine does not have to pull a pound. As soon as the pressure is off the drawbars the brakes are released. When the buffer is in its normal condition there is no pressure on the brakes.

### STANDARD TRUCKS.

Mr. FORNEY pointed out the difficulties in the way of getting men to agree on a standard truck. The ideas of different people must be reconciled, which was not an easy thing to do.

Mr. W. E. PARTRIDGE thought a large part of the difficulty arose from attempting to make one standard fit all the conditions of fast and slow service, good and bad track and light and heavy loads. It might be well to limit the discussion on trucks to trucks for some single service, when there would probably be very much less diversity of ideas in regard to the requirements, than in planning one truck for all services.

Mr. FORNEY: What Mr. Partridge says has in it a great deal of truth. Perhaps if we should adopt two standards we might get nearer a satisfactory result. The committee of the Master Car-Builders' Association have under consideration a standard truck for cars carrying, not to exceed 40,000 lbs., and it is for that service that a truck is to be proposed at the next convention. My own conviction is that, if that committee does its duty, we are nearer the adoption of a standard truck than we have ever been before. At the next meeting some action will be taken. The advantages to accrue from such action it seems to me are very great. It would certainly reduce the cost of trucks. Founders in different parts of the country who are in a position to manufacture castings at the very lowest cost, would manufacture standard castings for the truck, knowing that there would be a market for them. That has already followed the adoption of the standard axle. When business is dull they are manufactured for stock. The cost of repairs ought to be otherwise very much reduced.

Mr. SMITH pointed out the difficulty of getting individuals to adopt standards after the Association had recommended them.

Mr. PARTRIDGE: People will skin in every possible way, and this skinning process is applied to the Master Car-Builders' axle as well as everything else. It is impossible at the present time to manufacture parts for general use, simply because they are M. C. B. standard. There are minor deviations to fit ideas and fit conditions which are just sufficient to keep the patterns of one road from filling the specifications on another.

Mr. GAREY thought many of these variations were unintentional, and mentioned an instance where he had detected them and they had been at once corrected.

Mr. SMITH: Some time ago I was in the foundry of a man who received an order for so many hundred Master Car-Builders' journal bearings, "3 1/4 in. diameter." The man sent it back to the Purchasing Agent, and wanted to know if there was not some mistake, as the Master Car-Builders' journal was 3 1/2 in. The answer came back: "My order is correct. Make



your bearings as I order them and they will be all right." I believe that man was right in enlarging his journal, but it was not the standard, and others probably deviate in the same manner. I know there are a number of different journals known as "Master Car-Builders' standard," and they are not alike. As long as people will not abide by a standard when they get it, what are you going to do?

### New South Wales Railroads.

From a recent number of *Engineering* we extract the following data as to the lines now under survey or beginning construction, from which it would appear that railroad building is rather costly in that colony. The free use of heavy grades, combined with comparatively very easy curvature, is noticeable. We omit the names of the routes as of little interest in this country:

1. 83 miles, \$100,000 per mile.
2. 73 miles, \$90,000 per mile.
3. 12 miles, \$72,000 per mile, 2 1/2 per cent. grades.
4. 45 miles, \$65,000 per mile, 1 3/4 per cent. grades, 17 1/2 curves.
5. 105 miles, \$95,000 per mile, 2 1/2 to 3 per cent. grades; 10° 50' curves; 12 tunnels aggregating 7,300 ft.
6. 105 miles, \$90,000 per mile.
7. 70 miles, \$50,000 per mile.
8. 92 miles, \$48,000 per mile.
9. 33 miles, \$75,000 per mile.
10. 68 miles, \$52,300 per mile, 2 1/2 per cent. grades, 17 1/2 curves.
11. 40 miles, \$100,000 per mile, do. do.

In addition to the 196 miles above specified, four lines of "light railways," varying in cost from \$15,500 to \$23,500, are projected. On these lines it is proposed to use 60-lb. flat-footed rails instead of the 70-lb. to 75-lb. double-headed or chain rails used elsewhere; to use half-round sleepers with little ballast, and to use burnt clay for ballast wherever gravel and stone are not easily procurable. It is also proposed to follow, as nearly as practicable, the natural surface of the ground.

### ANNUAL REPORTS.

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### St. Paul & Duluth.

This company owns a line from St. Paul, Minn., to Duluth, 156 miles, with branches from White Bear to Minneapolis, 11 miles, and from Knife Falls Junction to Cloquet, 6 miles. It leases, and practically owns, the Stillwater & St. Paul, 13 miles, and a branch from Wyoming to Taylor's Falls, 31 miles. A new branch, from Rush City, Minn., to Grantsburg, Wis., 17 miles, was completed just at the beginning of the year, making the mileage for the year 227 miles. The main line for 24 miles from Duluth is owned and used in common with the Northern Pacific. The following statements are for the year ending Dec. 31 last:

The general account, condensed, is as follows:

Common stock (including scrip).....	\$4,055,407
Preferred stock (including scrip).....	5,378,970
Funded debt.....	1,000,000
Accounts and balances.....	841,990
Income accounts.....	569,322
<b>Total.....</b>	<b>\$11,843,689</b>
Road and equipment.....	\$10,185,369
Sundry accounts and balances.....	1,136,308
Cash and cash assets.....	522,012
<b>Total.....</b>	<b>\$11,843,689</b>

The bonds are all of one issue, first-mortgage 5 per cent. bonds.

The earnings for the year were as follows:			
1884.	1883.	Inc. or Dec.	P. c.
Earnings.....	\$1,317,314	\$1,328,598	D. 11.214
Expenses.....	841,571	902,979	D. 121,408
<b>Net earnings.....</b>	<b>\$475,743</b>	<b>\$365,549</b>	<b>I. 110,194</b>
Gross earn. per mile.....	5.803	6.328	D. 523
Net.....	2.066	1.741	I. 355
Per cent of exps.....	63.9	72.5	D. 8.6

The increase in net earnings was due entirely to the large reduction in working expenses made last year.

The income account was as follows:

Net earnings of road.....	\$475,743
Net income from land sales and stumpage.....	64,905
<b>Total.....</b>	<b>\$540,648</b>
Interest on bonds.....	\$50,000
Equipment trust, final payment.....	77,651
<b>Net income.....</b>	<b>\$463,997</b>
Surplus, Jan. 1, 1884.....	309,651
<b>Total.....</b>	<b>\$773,648</b>
Dividends on preferred stock.....	\$37,295
<b>Balance.....</b>	<b>\$235,353</b>

The deferred income from land and stumpage sales on Dec. 31 amounted to \$431,875. The dividends paid were 3 1/2 per cent. in cash and 7 per cent. in new preferred stock.

The net income for 1884 from the operation of the railroad alone was, for the first time, ample to pay the full 7 per cent. for the year on the preferred stock (requiring \$362,194), without recourse to the income from land and stumpage, and with it leave a balance of \$100,803 income from all sources for the year. The income from all sources for the six months ending Dec. 31, 1884, is sufficient to pay the full 7 per cent. on the preferred stock for the fiscal or dividend year ending June 30, 1885. This result was secured, notwithstanding a temporary falling off of lumber traffic, through an increase in the flour and grain traffic and a material reduction in operating expenses. The flour and grain business would have been largely increased but for the want of sufficient warehouses, elevators and vessels at Duluth, to be supplied during the present year. Of the lands of the company, 1,172,356 acres remain unsold, which, with 94,080 acres of the Taylor's Falls Branch, are not included in the balance sheet as of Dec. 31, 1884. The cost of the road and equipment is increased \$64,489 by improvement, construction and equipment expenditures during the year.

### Delaware, Lackawanna & Western.

The brief statement which is the only report made by this company gives the following figures for the year ending Dec. 31 last:

The company owns 207 1/2 miles of railroad, and a great coal property in Pennsylvania. It leases 151 miles of railroad in New Jersey, and leases and controls 515 1/2 miles in New York, making 874 miles worked last year.

The capital account is as follows, compared with last year:

	1884.	1883.	Inc. or Dec.
Stock.....	\$26,200,000	\$26,200,000	.....
Bonds.....	4,044,900	4,044,900	.....
Renewal fund.....	439,500	439,500	D.
Surplus account, Dec. 31.....	11,032,065	10,322,374	I.
<b>Total.....</b>	<b>\$41,720,965</b>	<b>\$41,007,034</b>	<b>I. \$713,931</b>
Construction account.....	\$4,250,418	\$3,089,386	I. 1,161,032
Materials on hand.....	1,049,712	1,265,810	D. 216,098
Stocks and bonds.....	5,449,713	6,503,851	D. 1,054,138
Balance of accounts.....	527,122	147,987	I. 379,135
<b>Total.....</b>	<b>\$41,720,965</b>	<b>\$41,007,034</b>	<b>I. \$713,931</b>

The amount given for stocks and bonds owned is their cost; their market value is stated at \$6,066,939. Construction account was increased \$1,161,032, the items being, for coal lands bought and improvements, \$170,066; for 21 new locomotives and 2,096 new cars, \$963,325; new tracks, buildings, etc., \$27,641.

The balance of accounts is taken from the following statement:

Cash on hand.....	\$730,812
Coal on hand (less the market value).....	1,100,494
Advances to leased roads.....	1,382,543
Advances on coal to be delivered, etc.....	838,147
Coal bills and sundry accounts due.....	1,372,895
Assets of N. Y., Lack. & Western Railway.....	950,200
Loans and sundry accounts receivable.....	1,118,012
<b>Total.....</b>	<b>\$7,463,103</b>

Past due dividends, interest and rentals.....	111,383
D. L. & W. dividend, payable Jan. 30, 1885.....	524,000
Rentals payable after 1st January.....	1,702,221
State taxes payable after 1st January.....	479,388
December pay rolls, payable in January.....	504,608
Bonds and mortgages.....	873,330
Vouchers due and payable after 1st January.....	1,023,690
Sundry accounts payable after 1st January.....	987,375
Sundry transfer accounts.....	720,000
<b>Total.....</b>	<b>6,935,981</b>

Balance..... \$527,122

Of the accounts payable there have been \$3,284,000 paid since the date of the account (Dec. 31).

The coal tonnage was 6,578,655 tons; in 1883 it was 6,616,028; a decrease of 37,363 tons, or 0.6 per cent., last year.

The earnings and expenses for the year were as follows, the figures including receipts from coal and all other sources as well as from transportation:

	1884.	1883.	Inc. or Dec.	P. c.
Earnings.....	\$31,311,962	\$32,819,005	D. \$1,507,043	4.6
Expenses.....	23,008,146	23,003,048	D. 5,098	0.4
<b>Net earnings.....</b>	<b>\$8,303,816</b>	<b>\$9,726,557</b>	<b>D. \$1,422,741</b>	<b>14.6</b>
P. c. of exps.....	73.5	70.1	I. 3.4	.....

The disposition of net earnings was as follows:

	1884.	1883.	Inc. or Dec.	P. c.
Net earnings.....	\$8,303,816	\$9,726,557	D. \$1,422,741	14.6
Interest, D. L. & W. bonds.....	\$283,143	\$283,143	.....	.....
Rentals of leased lines.....	4,630,179	4,663,801	I. 106,378	3.6
New equipment and tracks.....	385,033	1,072,816	D. 687,783	64.1
Dividends paid.....	2,090,000	2,090,000	.....	.....
<b>Total.....</b>	<b>\$7,594,353</b>	<b>\$8,115,700</b>	<b>D. \$521,405</b>	<b>6.4</b>
Surplus.....	\$709,491	\$1,610,797	D. \$901,306	55.9

Dividends paid were 8 per cent. in both years. The surplus in 1884 was equal to 2.7 per cent. on the stock, against 6.15 per cent. in the previous year.

### Chicago & Alton.

At the close of the 22d fiscal year, Dec. 31 last, this company operated lines as follows:

	Main Track.	Second Track.	Side Track.	All Tracks.
Chicago to Joliet.....	37.20	39.80	26.85	103.85
Joliet to East St. Louis.....	243.50	22.46	69.95	335.91
Can. City Branch.....	29.78	.....	9.56	39.34
Dwight to Washington and Lacon.....	79.80	.....	7.14	86.94
Roodhouse to Louisiana.....	38.10	.....	7.14	45.24
Bloomington to Wann, via Jacksonville, Godfrey and Upper Alton.....	158.00	.....	16.34	174.34
Louisiana & Missouri River.....	100.80	.....	16.75	117.55
Mexico to Kansas City.....	162.62	0.87	30.82	194.31
<b>Total miles.....</b>	<b>849.78</b>	<b>63.13</b>	<b>181.55</b>	<b>1,094.46</b>

All the lines are owned, except the Louisiana & Missouri River. There was no addition to the mileage of road worked last year, but an increase of 2.85 miles second track and 5.78 miles of sidings.

The equipment includes 228 locomotives; 119 passenger-train cars and 18 Pullman sleepers; 10 refrigerator, 3,213 box, 1,848 stock, 1,360 flat and coal and 100 caboose cars; 16 tool and boarding cars.

The general account is as follows, condensed:

Common stock.....	\$14,034,700
Preferred stock.....	3,479,500
Funded debt.....	13,039,950
Bonds redeemed and canceled.....	945,000
New common stock issued.....	52,800
Current account and balances.....	979,170
Sundry accounts.....	113,528
Kan. City, St. L. & Chi. construction fund.....	187,524
Income account.....	2,150,433
<b>Total liabilities.....</b>	<b>\$34,991,605</b>
Road and equipment.....	\$26,228,772
St. Louis, Jacksonville & Chicago.....	2,533,300
Cash and balances receivable.....	1,432,917
Supplies, tools and machinery.....	524,723
Stocks, bonds, etc.....	372,220
Kan. City, St. L. & Chi. first-mortgage bonds.....	3,000,000
Miss. River Bridge bonds and stock.....	497,000
Sundry accounts and balances.....	382,673
<b>Total assets.....</b>	<b>\$34,991,605</b>

The funded debt includes \$2,883,000 firsts; \$4,379,850 consolidated sterling; \$2,655,000 sinking fund gold bonds; \$2,365,000 firsts and \$66,000 seconds, St. Louis, Jacksonville & Chicago; \$564,000 firsts and \$188,000 seconds, Louisiana Branch; \$439,100 Louisiana & Missouri River firsts. The company also pays interest on \$684,000 Mississippi River Bridge bonds; 7 per cent. on \$1,500,000 Joliet & Chicago stock and \$900,000 Mississippi River Bridge stock,

and 6 per cent. on \$1,750,000 Kansas City, St. Louis & Chicago preferred.

During the year 10,541 shares of preferred and 15,328 shares of common stock were issued in exchange for an equal amount of St. Louis, Jacksonville & Chicago stock, in pursuance of the agreement of consolidation. This retires all the preferred stock of that company and all but 528 shares of the common.

There were \$85,000 bonds redeemed and canceled by the sinking funds during the year.

The traffic for the year was as follows:

Car miles:	1884.	1883.	Inc. or Dec.	P. c.
Pass.-train cars.....	10,090,439	9,119,810	I. 970,629	10.6
Freight cars.....	75,429,963	69,308,415	I. 6,121,548	8.8
<b>Total.....</b>	<b>85,520,402</b>	<b>78,428,225</b>	<b>I. 7,092,177</b>	<b>9.0</b>
Passengers carried.....	1,907,486	1,805,140	I. 102,346	5.7
Passenger miles.....	119,946,417	106,028,070	I. 13,917,741	13.1
Tons freight carried.....	3,598,284	3,488,496	I. 109,788	3.1
Ton-miles.....	602,768,054	549,369,534	I. 53,398,520	9.7

Per pass.-mile..... 1.899 cts. 2.141 cts. D. 0.242 ct. 11.3

Per ton mile..... 1.007 " 1.128 " D. 0.121 " 10.7

In addition to the tonnage given above, 458,956 tons company's freight were hauled. Of the freight car mileage last year 72.1 per cent. was of empty cars. The average passenger journey was 62.9 miles; the average freight haul was 167.5 miles. The average tonnage for loaded cars was 11.09 tons; for all cars, 7.99 tons. Of the total tonnage coal formed 1,278,320 tons. There were 788,102 pieces of baggage checked.

The earnings for the year were:

	1884.	1883.	Inc. or Dec.	P. c.
Freight.....	\$6,073,675	\$6,107,681	D. \$34,006	2.0
Passengers.....	2,278,429	2,270,379	I. 8,050	0.4
Mail.....	137,931	128,274	I. 9,657	7.5
Express.....	167,731	163,119	I. 4,612	2.8
Miscellaneous.....	51,508	51,157	I. 351	0.7
<b>Total.....</b>	<b>\$8,700,274</b>	<b>\$8,810,610</b>	<b>D. \$101,336</b>	<b>1.2</b>
Expenses.....	4,886,046	4,879,958	I. 6,088	0.1

Net earnings.....	\$3,822,628	\$3,930,652	D. \$108,024	2.7
Gross earn. per m.....	10.249	10.368	D. 119	1.2
Net earn. per m.....	4.498	4.626	D. 128	2.7
Per cent of exps.....	5.11	55.39	I. 0.72	.....

Taxes are not included above. They amounted last year to \$247,144, and would have raised the expenses to \$8,957 per cent.

The amount paid for labor and personal services was \$2,931,366. Of the total expenses 51.8 per cent. was paid for labor, 35.8 per cent. for supplies and fuel and 12.4 per cent. for miscellaneous expenses.

The income account was as follows:

Balance Dec. 31, 1883.....	\$1,026,704
Interest on bonds, dividends on stocks owned and sundry receipts.....	278,818
Gross receipts from traffic.....	8,709,274
<b>Total.....</b>	<b>\$10,014,796</b>

Interest on funded debt.....	\$770,683
Dividends, 8 per cent.....	1,048,840
Rents paid.....	823,565
Paid for sinking fund bonds purchased.....	87,876

" from this account for additional property, engines, cars, real estate, new buildings, new tracks, stone ballast, etc..... 292,221

Paid state, county and municipal taxes..... 247,144

Operating expenses (exc. undue taxes)..... 4,886,046

Suspended account written off..... 388

**Total.....** 8,755,363

Balance Dec. 31, 1884..... \$2,150,433

The President's report says: "The total gross earnings from farm products shipped at local stations were:

	In Illinois.	In Missouri.	In Illinois and Missouri.	Per cent. of freight of all.
1881.....	\$789,324	\$301,662	\$1,090,986	18.48
1882.....	397,424	1,169,237	1,566,661	14.195
1883.....	576,793	455,039	1,031,832	16.648
1884.....	528,615	340,656	869,271	14.312

Decrease..... \$48,178 \$114,383 \$162,561 2.336 1.730

"The foregoing tabular statement shows that less than one tenth of the gross earnings of our lines during the last year was derived from the transportation of farm products shipped at local stations, and that only 14.312 per cent. of the freight earnings during the year was derived from that traffic. \* \* \*

"Eight locomotives and 589 cars for use in passenger and freight traffic have been built during the last year, to replace an equal number of locomotives and cars worn out, and all necessary repairs have been made to maintain the rolling stock on our lines in good condition.

"Four new buildings have been added to our system of shops at



\$62,676, and town lots for \$1,200. Its total receipts were \$101,344; expenses, \$14,162; it holds \$274,918 in land notes. Total sales have been 2,436,838 acres, leaving only 157,437 acres unsold.

The general account is as follows, condensed:

<b>Liabilities:</b>	
Capital stock of Illinois Central Railroad Co.	\$29,000,000
Funded debt	10,000,000
Past due and called bonds	17,000
Capital stock, Chicago, St. Louis & New Orleans Co.	10,000,000
<b>Funded debt:</b>	
Mississippi Central 8s.	\$563,500
New Orleans, Jackson & Great Northern	
8s of 1880	2,090,000
New Orleans, Jackson & Great Northern	
8s of 1880	1,483,000
Chicago, St. Louis & New Orleans 7s.	1,400,000
Chicago, St. Louis & New Orleans 6s.	80,000
Chicago, St. Louis & New Orleans gold 5s.	11,774,000
	17,990,500
Past due and called bonds	9,500
Set apart to provide for dividend payable March 2, 1885	1,160,000
Set apart to pay for purchases of additional equipment	
Surplus dividend fund	294,139
Profit and loss	4,965,182
Insurance fund	37,486
<b>Total liabilities</b>	<b>\$73,821,807</b>
<b>Assets:</b>	
Permanent expenditures, Illinois	\$33,000,000
Springfield Division	1,606,000
Middle Division	1,432,850
South Chicago R. R.	183,732
Southern Division	28,000,000
West & East R. R.	141,000
Canton, Aberdeen & Nashville	1,882,403
Yazoo & Mississippi Valley	857,694
<b>Total</b>	<b>\$67,107,685</b>
Permanent expenditures, Iowa Division	1,321,420
Working stock of supplies	483,467
Net assets, New York	4,705,942
Chicago	165,801
Assets in insurance fund	37,486
<b>Total assets</b>	<b>\$73,821,807</b>

The funded debt of the Illinois Central Co. includes \$2,500,000 sterling 6s; \$1,000,000 Springfield Division 6s; \$4,000,000 sterling sinking fund 5s; \$1,000,000 sterling 5s of 1905; \$968,000 Middle Division 5s; a total of \$10,068,000.

The traffic for the year was as follows:

<b>Tram miles:</b>					
Passenger	3,181,625	2,920,236	I.	255,389	8.7
Freight	4,891,182	5,494,789	D.	603,607	12.6
Service and switch	2,138,627	2,281,127	D.	142,500	7.2
<b>Total</b>	<b>10,121,434</b>	<b>10,792,152</b>	<b>D.</b>	<b>580,718</b>	<b>5.4</b>
Passengers carried	4,848,140	4,354,033	I.	494,107	11.4
Passenger-miles	123,583,470	113,332,918	I.	10,250,552	9.0
Tons frt. carried	3,354,065	3,638,562	D.	284,477	5.2
Ton-miles	577,542,939	604,632,667	D.	27,089,728	4.5
<b>Av. train load:</b>					
Passengers, No.	39	39			
Freight, tons	120	110	I.	10	9.1
<b>Av. rate:</b>					
Per passenger-mile	2.23 cts.	2.43 cts.	D.	0.20 ct.	8.2
Per ton-mile	1.37 "	1.43 "	D.	0.06 "	4.2

The earnings per train mile last year were 102.42 cents for passenger and 174.07 for freight; for all trains, 120.45; expenses, 60.55; net, 59.90 cents. The average passenger journey was 25.49 miles; the average freight haul, 172.19 miles. Excluding the Chicago suburban business, the average passenger journey was 50.26 miles.

The earnings for the year were:

	1884.	1883.	Inc. or Dec.	P. c.
Freight	\$7,902,043	\$8,684,958	D.	\$782,915 8.8
Passengers	2,749,940	2,747,222	I.	2,718 0.1
Mail and Express	508,616	603,786	D.	95,170 15.7
Sleeping cars	56,675	50,892	I.	5,783 11.3
Rents, etc.	973,559	997,885	D.	24,326 2.4
<b>Total</b>	<b>\$12,190,833</b>	<b>\$13,084,743</b>	<b>D.</b>	<b>\$893,910 6.7</b>
Expenses	6,128,511	6,435,271	D.	306,760 4.8
<b>Net earnings</b>	<b>\$6,062,322</b>	<b>\$6,649,472</b>	<b>D.</b>	<b>\$587,150 8.5</b>
Gross earn. per m.	6.065	6.776	D.	681 10.1
Net earn. per mile	3.031	3.439	D.	408 11.9
Percent. of exps.	50.27	49.25	I.	1.02

Of the total gross earnings last year, the lines in Illinois furnished \$6,158,312; the Southern Division, \$4,320,131, and the leased lines in Iowa, \$1,712,990.

The result of the year was as follows:

Net earnings, as above	\$6,062,322
Charter tax paid state of Illinois	\$356,680
Other taxes	189,289
Rentals leased lines in Iowa	683,466
Other rentals	12,340
<b>Total</b>	<b>\$7,304,103</b>
Net income	\$4,820,544
Net receipts of land office	87,182
Interest, exchange, etc.	222,982
Surplus fund, Dec. 31, 1883	156,969
<b>Total</b>	<b>\$5,287,627</b>
Interest on bonds	\$546,800
Sinking fund bonds drawn for payment	50,000
Interest and dividends, Southern Division	1,491,567
Construction account	219,943
Swedge-block judgment	115,138
Set apart for new equipment	250,000
Dividends, 8 per cent.	2,320,000
<b>Total</b>	<b>\$4,963,488</b>
Balance to surplus dividend fund	\$294,139

Improvements during the year included the completion of the third and fourth tracks to Grand Crossing; 8.91 miles new sidings; 83.70 miles of new ballast; 89.41 miles of new fence; a new iron bridge, 510 ft. long, over the Kankakee River. A new transfer boat with a capacity of 18 cars was completed for the Cairo transfer.

Renewals included 6,343 tons of steel rails and the rebuilding of 12,137 ft. of pile and trestle bridge. Six locomotives were built to replace old ones worn out; four new baggage cars were built in the shops, besides a large number rebuilt.

The report of the directors says: The gross sum received by this company from the traffic during the past year was \$12,190,833; in 1883 the sum received was \$13,084,743.

More than one-third of the decrease was in the earnings of the Dubuque & Sioux City and Iowa Falls & Sioux City Railroads, which are under a lease to this company on payment of a percentage of their gross earnings. By a diminution in the rentals paid to the lessor companies, and in the expenses of the operation of these roads, the net result to this company from the Iowa Division has been, in 1884, a loss of only \$83,855, without charging the Iowa Division with interest on the cars and locomotives used thereon (valued at \$591,667), or rent for the terminal facilities, in Dubuque and in Chicago, owned by this company. In 1883 an apparent profit of \$35,534 was derived by this company from the Iowa Division on a like basis.

The net earnings of the railroad in 1884 were \$4,820,544; and in 1883 were \$5,264,157.

Many years ago a suit was begun against this company

for an infringement of letters patent to Cawood for a improvement in the common anvil or swedge-block for welding up or reforming the ends of iron rails. Last spring the Supreme Court of the United States ordered, in effect, that a judgment be entered against this company for the payment of \$115,138 as damages for such infringement from Sept. 9, 1856, to Nov. 11, 1872. That sum has been paid out of the income of the last year.

The physical condition of the property of this company has been fully maintained in every respect, and the road-bed, bridges and rolling stock have been materially improved during the past year.

Upon the leased lines in Iowa an expenditure of \$50,638 has been made in 1884 for improvements properly chargeable to construction, which makes the total sum charged to permanent expenditures in Iowa \$1,321,420. By the terms of the lease the lessor is to pay to the lessee the appraised value of all such improvements at the expiration of the present lease of the Dubuque & Sioux City Railroad (October, 1887), and the first cost of all real estate furnished by the lessee, if the Illinois Central Railroad Co. shall exercise its option to surrender the lease. This company has, however, the option to renew the lease in perpetuity, on paying the present rental of 36 per cent. of the gross earnings. The attention of stockholders is particularly called to the steady diminution in the value of these Iowa lines, both intrinsically and as feeders to the lines in Illinois.

The Canton, Aberdeen & Nashville Railroad has been completed to Aberdeen, and, with the Kosciusko Branch and the West & East Railroad, will be operated as a continuous line of 118 miles from Lexington, Miss., to Aberdeen, Miss. The Yazoo & Mississippi Valley Railroad has also been completed and extended through Yazoo City to the northern limits of the town, with the view of continuing the line toward Memphis.

Both of these lines are exempt from taxation for 20 years. Besides furnishing a large amount of new business to the main line of the Southern Division (which in a measure accounts for the comparatively small decrease in the earnings of this division), these roads have already earned, locally, \$122,277 gross and \$58,680 net, of which \$63,672 gross and \$39,095 net were earned in November and December.

The outlays during the year on capital account, not charged against income, have been as follows:

South Chicago Railroad	\$22,298
Canton, Aberdeen & Nashville Railroad	409,904
Yazoo & Mississippi Valley Railroad	128,913
Iowa Division	50,637
<b>Total</b>	<b>\$611,752</b>

Since the directors' last report the company has sold Chicago, St. Louis & New Orleans 5 per cent. bonds as follows:

Against expenditures on capital account during 1883 as stated in last report	\$402,000
For expenditures on Canton, Ab. & Nash. and Yazoo & Miss. Vy. roads in 1884	501,000
<b>Total</b>	<b>\$903,000</b>

The debt of the Illinois Central Railroad Co. has been reduced \$60,000 by the payment of bonds drawn under the sinking fund. In this way and by the funding of 7 per cent. and 8 per cent. bonds of the Southern Division into 5s, the fixed charges of this company, including rent of Southern Division and contribution to the sinking fund, will in 1885 be about \$16,000 less than in 1884. On the other hand, the company will receive in 1885 about \$38,000 less from investments in the bonds and stock of the Chicago, St. Louis & New Orleans Co. than was received in 1884. This will be very much more than made good by the income to be derived from the first mortgage bonds of the Canton, Aberdeen & Nashville and of the Yazoo & Mississippi Valley companies, which will replace in the treasury the Chicago, St. Louis & New Orleans 5s sold during the past two years to build and equip these roads.

The question of the company's riparian rights on the Lake front in Chicago has been carefully considered by the board. Mr. Ayer, the General Solicitor of the company, Hon. Lyman Trumbull, and Hon. John N. Jewett, of Chicago, have, each of them, in response to a resolution of the board, written separate and elaborate opinions vindicating the rights contended for by this company that were granted to it by its charter, by the various amendments thereof, and by the Illinois law of 1869, as well as the constitutionality and validity of the several grants.

In closing its annual report for 1884, the board desires to express to the share-owners its high appreciation of the zeal and fidelity with which the officers and servants of the company on the line of the road have, during the past year, labored in its behalf. It is to that energy and integrity, displayed all along the line, which traverses so many states and which encounters such a variety of conditions of climate, labor, industry and production, that the company is largely indebted for the relatively small diminution in its net earnings during a year of severe depression in trade and business, which has so generally and greatly interfered with the prosperity of railways.

#### Northern Central.

This company owns a line from Baltimore north to Sunbury, Pa., 139 miles, with a branch from Relay House to Green Spring, Md., 9 miles. It leases the Shamokin Valley & Pottsville road, Sunbury, Pa., to Mt. Carmel, 28 miles; the Williamsport & Elmira, 78 miles; the Chemung, 22 miles; and the Elmira & Canandaigua, 47 miles; these three roads forming a line from Williamsport, Pa., to Canandaigua, N. Y., 147 miles. The total is 148 miles owned and 323 worked. Its trains use the Philadelphia & Erie track from Sunbury to Williamsport, 40 miles, and the Philadelphia & Erie trains use its track from Sunbury to Marysville, 47 miles. The report is for the year ending Dec. 31.

The company also owns the stock of the Union Railroad which connects its station in Baltimore with the wharves at Canton and the Philadelphia, Wilmington & Baltimore and the Baltimore & Potomac roads. It also controls (through purchase last year, as noted below) the Sodus Bay & Southern road, from Stanley, N. Y., to Sodus Point, 34 miles.

The company is controlled by the Pennsylvania Railroad Co., its main line forming that company's connection with Baltimore.

The general account was as follows:

Stock	\$6,500,000
Maryland state loan, irredeemable, 6 per cent.	1,500,000
Funded debt	13,753,000
Mortgages and ground rents	433,821
Accounts and balances	1,265,162
Depreciation fund, coal lands	186,478
Profit and loss, balance	1,195,210
<b>Total</b>	<b>\$24,833,671</b>
Road and equipment	\$18,060,865
Mortgages and ground rents	9,732
Stocks of leased lines	3,048,681
Other stocks and bonds	1,521,124
Trustees of sinking fund	550,792
Depreciation fund	154,980
Materials on hand	340,459
Accounts receivable	447,462
Cash	609,556
<b>Total</b>	<b>24,833,671</b>

Stock was not changed during the year; funded debt was

decreased \$93,000 by the sinking funds. The bonded debt (besides the Maryland loan, which is irredeemable) includes \$1,490,000 mortgage 6s of 1885; \$1,136,000 mortgage 6s of 1900; \$2,804,000 gold 6s of 1900; \$4,492,000 consolidated general mortgage 6s, and \$3,841,000 second general mortgage 5s.

The insurance fund now holds assets amounting to \$150,992. Its income last year was \$27,752. The expenses were \$5,471, and the sum of \$13,070 was invested for the fund.

The traffic for the year was as follows:

	1884.	1883.	Inc. or Dec.	P. c.
Passengers carried	3,131,747	2,848,547	I.	283,200 9.9
Passenger-miles	39,000,765	38,003,861	I.	1,006,904 2.7
Tons freight carried	10,774,129	11,394,730	D.	620,601 5.4
Ton-miles	506,975,576	521,889,324	D.	14,913,748 2.9
<b>Av. rate:</b>				
Per pass.-mile	2.391 cts.	2.452 cts.	D.	0.062 ct. 2.5
" " net	0.388 "	0.335 "	I.	0.053 " 15.8
Per ton-mile	0.825 "	0.910 "	D.	0.085 " 9.0
" " net	0.295 "	0.330 "	D.	0.035 " 10.6

The passenger rate was highest on the main line and lowest on the Chemung Division. On the Green Spring Branch and the Shamokin Division there was a loss on all passengers.

The earnings, expenses and profit per ton-mile on the several divisions of the road were, in cents:

	1884.	1883.	Inc. or Dec.	P. c.
Main line	0.870	0.545	0.325	0.932 0.630 9.02
Green Spring Branch	3.429	2.633	0.796	3.619 2.201 1.418
Shamokin Division	1.174	0.527	0.647	1.095 0.449 0.646
Elmira Division	0.646	0.473	0.173	0.721 0.504 0.217
Chemung Division	0.468	0.424	0.044	0.524 0.415 0.109
Canandaigua Division	0.690	0.604	0.086	0.742 0.589 0.153
<b>All lines</b>	<b>0.825</b>	<b>0.530</b>	<b>0.295</b>	<b>0.910 0.580 0.330</b>

On the Chemung Division the average rate received was less than half a cent per ton-mile. The cost was still lower, leaving the minute profit of forty-four thousandths of a cent per ton-mile. This division is 22 miles long and carries chiefly through freight and coal.

The coal tonnage of the main line was 2,446,425 tons; Green Spring Branch, 4,043; Shamokin Division, 1,299,173; Elmira Division, 1,063,222; Chemung Division, 613,484; Canandaigua Division, 579,278 tons. The total coal tonnage was:

	1884.	1883.	Inc. or Dec.	P. c.
Anthracite	2,721,177	2,462,664	I.	320,513 13.3
Bituminous	1,633,516	1,123,369	D.	89,853 8.0
<b>Total</b>	<b>3,756,693</b>	<b>3,520,033</b>	<b>I.</b>	<b>230,660 6.5</b>

The decrease in bituminous was in tonnage from the Ralston mines and the Tioga road. Of the anthracite 697,781 tons were carried to Baltimore.

The grain carried to Baltimore last year was 10,040,547 bushels, against 13,602,318 in 1883; a decrease of 3,561,771 bushels, or 26.2 per cent.

The earnings for the year were:

	1884.	1883.	Inc. or Dec.	P. c.
Freight	\$4,181,442	\$4,049,929	D.	\$568,487 12.0
Passengers	932,848	932,390	I.	458
Mail and express	123,711	123,801	D.	90 0.1
Miscellaneous	283,676	282,011	I.	1,665 0.7
<b>Total</b>	<b>\$5,521,677</b>	<b>\$5,078,131</b>	<b>D.</b>	<b>\$506,254 9.3</b>
Expenses	3,468,393	3,831,605	D.	363,212 9.5
<b>Net earnings</b>	<b>\$2,053,484</b>	<b>\$2,256,526</b>	<b>D.</b>	<b>\$203,042 9.0</b>
Gross earn. per mile	17.096	18.907	D.	1.811 9.5
Net " "	6.358	7.008	D.	650 9.3
Percent. of exps.	62.8	62.9	D.	0.1

The gross earnings per mile on the main line were \$27,800; Green Spring Branch, \$889; Shamokin Division, \$15,637; Elmira Division, \$9,632; Chemung Division, \$7,232; Canandaigua Division, \$6,412.

The result of the year was as follows:

Net earnings, as above	\$2,053,484
Interest and dividends received	256,363
Penna. R. R. Co., share of loss on leases	7,467
<b>Total</b>	<b>\$2,317,314</b>
Rentals paid	\$469,089
Interest on bonds	\$79,410
Other interest and taxes	103,787
Dividends, 8 per cent.	520,000
<b>Total</b>	<b>1,063,286</b>
Surplus for the year	\$354,028
Balance, Jan. 1, 1884	\$925,529
Less depreciation account	84,347
<b>Total</b>	<b>\$1,195,210</b>

Included in expenses were permanent improvements amounting to \$276,188, the chief items being cost of new line to Calvert station and new freight house, \$99,279; new piers at Canton, \$60,125; Rockville Branch, \$59,500; new sidings, \$16,875.

The royalty received from the Mineral Railroad & Mining Co., \$31,248, was all credited to depreciation fund on coal lands.

There was \$41,800 paid out for purchase of real estate. In June 300 hopper gondola and 400 long gondola cars, costing \$290,000, were bought under a car trust.

The report says: "The lines north of Williamsport, to Canandaigua, show a loss of \$7,467 to your company (under the adjustment agreement with the Pennsylvania Railroad Co.), as compared with a profit in 1883 of \$47,831."

"On July 1, 1884, your company purchased the entire capital stock of the Sodus Bay & Southern Railroad Co., amounting to \$500,000, at a cost of \$100,000 in cash. In addition thereto, it paid to the owner of said stock \$25,000, receiving therefor his individual obligation to pay off and discharge all debts and incumbrances of every kind that might exist against the said road in excess of the first-mortgage bonds, amounting to \$500,000, bearing 5 per cent. interest, and maturing July 1, 1924. It was further stipulated in the contract of purchase, that the road should be put in a condition equal to the Elmira & Canandaigua Division of your line, at a cost estimated at about \$150,000. A considerable portion of this expenditure has already been made, and the sum so expended together with that necessary to meet the interest maturing Jan. 1 on the bonds referred to, making an aggregate of \$81,492, has been charged to your profit and loss account. This road is 34 miles long, extending from Stanley, a point on your Elmira & Canandaigua Division, 12 miles south of Canandaigua, to Sodus Point on Great Sodus Bay, and thus providing an outlet on Lake Ontario for your system of roads, and additional valuable connections with important lines of railway. The road is operated as a portion of your Elmira & Canandaigua Division.

"The Baltimore & Potomac Railroad, your connecting line to Washington and other Southern points, shows gratifying results, there having been an increase in 1884 over the previous year in both the gross and net earnings, and a surplus after providing for the interest on its first-mortgage bonds.

"A traffic contract has been entered into with the Stewartstown Railroad Co., which is constructing a road 7 miles in length from New Freedom, on your main line, to Stewartstown, Pa., under which your company will secure all traffic controlled by that company and destined to and from points reached by your main line and its connections."





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## EDITORIAL ANNOUNCEMENTS.

**Passes.**—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

**Contributions.**—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

**Advertisements.**—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

## USEFUL AND USELESS CHECK-CHAINS.

An accident which happened a few days ago on the Ohio & Mississippi Railroad, by which the rear sleeping car of a heavy passenger train was wrecked, causing the death of five out of the six persons within it, is worthy of attention as a somewhat exaggerated type of a large class of accidents. According to the press report the sequence of events was as follows:

"About a quarter of a mile after leaving North Vernon the rear car struck a broken rail and left the track, but owing to the icy condition of the road-bed, ran along without much jolting. The conductor was not aware that anything was amiss, and the train kept on increasing its speed in spite of the efforts of the Pullman car porter, who endeavored to communicate with the engineer by pulling the bell rope, but without success. Soon the train was running at a speed of fully 25 miles an hour. When the derailed coach reached a curve which preceded a trestle, 500 ft. long and 75 ft. high, over the Muscatuck River, it swung further out of position. When the trestle itself was reached, the car wheels on one side were in the middle of the track, while the other side careened over the edge of the trestle work. Nearly over the trestle the car swung around, and a terrific crash followed, tearing the coach asunder, and smashing it with great force against the stone abutment. The speed of the train jerked the forward truck of the coach from under it and swung it over the track, the other truck going down an embankment, and over 200 ft. away. The rest of the train went on ahead a mile or more before stopping."

It would appear from this account that the truck made every effort which a good truck could not to leave the ties, for it ran a long distance before doing so. It is also tolerably clear that the check-chains can hardly have been brought into action at all before the final catastrophe, because, had the truck slewed enough to take up the 10 to 14 in. slack usually left in check-chains, it would presumably have left the rails much sooner than it did, before the bridge had been entered upon at all.

Without dwelling now upon another lesson of this disaster—that a rerailling bridge safety-guard would very probably have replaced the truck upon the rails unharmed, as it did in an instance on the New York, Ontario & Western Railway noticed last week—the frequency with which the order of events in cases of derailments is something the same, except that the interval of time and space between the beginning and end is not quite so great, is well calculated to raise a doubt whether check-chains are not provided with the conditions for their own destruction in the entirely needless amount of slack which is given them.

The facts in respect to their attachment seem to be these:

1. As now commonly attached they do not come to a bearing until the truck has slewed from 10 to 14 or even 16 in. out of line.

2. The amount of slack for which there is legitimate use (as shown in detail below) is only  $\frac{1}{4}$  to  $\frac{1}{2}$  in. per degree of the curve.

3. Without some little modification in the manner of attaching them the slack cannot be made much less,

but their attachment so as to act efficiently with any desired amount of slack is a mere matter of detail.

4. The distance from the rail to the end of the ties is only 18 to 24 in. As therefore the car body itself is continually moving to one side after derailment, and as 10 to 14 in. more deviation yet of the wheels (due to slewing) must take place before the check-chains come to a bearing, they cannot as a rule come to a bearing until one wheel at least has entirely left the ties.

5. If by some unusual accident the truck slews so quickly as to bring the check-chains to a bearing before any wheel has left the ties, the truck has even then slewed to such an angle that speedy running off the ties must almost instantly ensue.

6. When from any cause one side of the truck has left the ties altogether, the destructive forces are so enormous that the chances of any check-chain proving useful, even in a slight degree, are not very great—far less than that they will snap like pipe-stems.

7. The latter occurs so frequently that check-chains are almost never used on the short trucks of freight cars and are omitted on many passenger cars. Yet even under such disadvantages they are so frequently useful that the Master Car-Builders' Association has formally advised their general use as "when properly applied, a valuable acquisition."

If the facts have been correctly stated, it is a question worthy of careful consideration whether a more mechanical method of attaching the check-chains, so as to restrain the first beginnings of abnormal tendency to slew, so that the slack shall no longer be many times greater than is legitimately required, may not give a great additional safeguard at almost nominal cost.

The amount of slack absolutely required for legitimate necessities in passing curves (assuming the check-chains to be applied opposite the wheels) is, in detail, as follows:

Longest ordinary sleeping cars, 46 ft. centre to centre of truck, 67 ft. out to out, 10 ft. wheel-base.

Required lateral play per degree of curve, less than  $\frac{1}{4}$  in.

Ordinary passenger cars, 33 ft. centre to centre of truck, 53 ft. out to out, 7 ft. wheel-base.

Required lateral play per degree of curve, less than  $\frac{1}{4}$  in.

Long box cars, 24 ft. centre to centre of truck, 37 ft. out to out, 5 ft. wheel-base.

Required lateral play per degree of curve, about  $\frac{1}{16}$  in.

Short box cars, 20 ft. and 31 ft., 5 ft. wheel-base.

Required lateral play per degree of curve, about  $\frac{1}{16}$  in.

The calculations on which these results are based are so simple that it is unnecessary to give them at length. They were given for an ordinary passenger car in an article entitled "Check Chains that Do Not Check," published in the *Railroad Gazette* of March 14, 1884, discussing this same question, and in a table below we give the elements which will enable them to be readily checked. It is to be remembered, too, that no account is taken of the clearance between rail and wheel, which, at one-half inch, would alone enable, in theory, a long sleeping car pass around a 2 degree curve, and a short box car around a 10 degree curve, without any swivelling of the truck and without derailment. The end play of the axles gives some further margin of safety, which has been neglected.

	Long sleeper.	Pass'r car.	Long box car.	Short box car.
Length of car, centre to centre of truck.....	46 ft.	33 ft.	24 ft.	20 ft.
Central angle covered by that length on a 1° curve.....	0.46°	0.33°	0.24°	0.20°
Corresponding angle between axis of truck and car-body.....	0.23°	0.165°	0.12°	0.10°
Deviation between the two axes in 100 ft. at 21 in. per degree (inches).....	4.83"	3.465"	2.52"	2.10"
Half length of wheel-base.....	5 ft.	3.5 ft.	2.5 ft.	2.5 ft.
Corresponding deviation between the two axes, for a length equal to half the wheel-base, inches.....	0.2415"	0.1213"	0.063"	0.0525"
(Equal in vulgar fractions to).....	( $\frac{3}{4}$ —)	( $\frac{1}{8}$ —)	( $\frac{1}{16}$ —)	( $\frac{1}{20}$ in.)

For any sharper curve than 1 degree, the amount of play required is given by multiplying the above by the degree of curvature.

Now, neglecting for the moment all reference to freight cars, which run everywhere, the sharpest curve over which a passenger car will have to pass in regular service is known with great certainty, and the sharpest curves over which it will have to pass at speed, where a derailment would be most dangerous, is known with still greater certainty. Therefore, assuming the check-chains to be so attached as to leave just sufficient play to pass freely over its required daily route and no more, the amount of play actually necessary for passing over say a 10 degree curve will be seen from the above to be only some  $\frac{1}{4}$  in. for long sleeping cars and  $\frac{1}{8}$  in. or less for ordinary passenger and baggage cars.

All slack in excess of this is entirely useless for the necessities of ordinary service, for the great majority of passenger cars pass their entire lives without going over curves, even in yards, much sharper than 10 or 12 degrees, and many never pass over a sharper curve than even one of 5 or 6 degrees on the open road. It is, of course, always a possibility that a car will need in some emergency to pass around some exceptionally sharp curve, but it is a simple matter to provide convenient means, like the hook now used, for removing the check-chains in such cases; and granting that some cases of derailment might occur from carelessness in this respect while pushing the cars into some exceptionally sharp side-track, yet a little ordinary caution would prevent them, and they necessarily occur at comparatively slow speed, so that they would detract little from the value of reducing the far greater danger of ditching cars derailed at high speed on the open road.

The truth is that the perfection to which the construction and use of track and rolling stock has been brought, so that the danger of disaster is so much less than would be credible, if experience had not proved it, is apt to blind one to the small margin which really exists between safety and destruction. One is apt to think of a train of cars as if it were something like a string of wagons, hitched one behind the other by their poles, and equally disposed to follow each other quietly. On the contrary, there can be no doubt that the wheels of a truck are, as it were, constantly hunting for the first weak spot, on one side of the track or the other, and ready to break away from control entirely so soon as they find it. The only marvel is that they so rarely do find it.

To make a true parallel between the truck and the wagons, we should have, first, to conceive of the wagons with both axles fixed parallel with each other so that they cannot be given a tendency to curve at all. We should, secondly, have to conceive of them as propelled, not by shafts or a pole in front, but by force applied to a pin stuck in their centres, so that it could have no guiding tendency whatever. If we conceive of a dozen or twenty such wagons, placed 25 to 45 ft. apart, and connected together by a loose rope or rod only, with a powerful "motor" attached to their head, and attempting a progress down Broadway, we have a pretty close mechanical parallel to the erratic tendencies which exist in an ordinary railroad train, and which are restrained by the flanges and rails.

It is probable that such a train of wagons would speedily find the space from curb to curb all too narrow, and that trouble would soon follow. So it would be with a railroad train, except that for railroad purposes the curbstones (now known as rails) have been narrowed up to within 4 ft. 8½ in. of each other, and are made of steel instead of stone. But as in cases of derailment the protection of the rail is wholly lost, is it wise to leave trucks free to swivel through 90 degrees when anything more than 2 or 3 degrees (corresponding to a 18 degree curve for the longest cars) "cometh of evil?" It hardly seems so.

A check-chain to allow so little play as suggested could not, of course, be attached almost vertically, as now, but would need to run obliquely, either from the centre sills to the corners of the truck, or from the side sills to an attachment near the centre line of the truck. When attached in this manner a slotted bar might be more convenient than a chain. In whatever manner attached, however, it would need far less strength than the ordinary attachment to have an equal chance of holding, or, if of equal strength, it would have far greater chance of not rupturing. For, although we cannot measure the absolute amount of the destructive forces, yet it is certain that a restraining force applied quickly, before the wheels have deviated much from their proper path, and above all, before they have left the ties, will immensely increase the probability of the trucks continuing to perform their proper function until the train is stopped.

An indication of the gain which might perhaps be realized is given by the comparative immunity which the locomotive enjoys in cases of derailment. A marked instance was the recent catastrophe on the Houston & Texas Central Railway at the Brazos River bridge, the worst train accident of the past year, which appeared to have been a case of deliberate train wrecking produced by displacing the rails. The train was running at a high rate of speed, a heavy fog hiding the danger till the train was upon it. "The locomotive," the report said, "crossed the gap and reached the other side in safety. The baggage car jumped the track, the coupling with the tender parting, trembled for an instant on the brink, and then dashed into the Brazos. The express and smoking car followed. \* \* \* A ladies' coach and sleeping coach



followed," etc., etc., 32 passengers being killed or injured.

Fortunately, few such accidents have such disastrous results, but the frequency with which the general sequence of events is the same—the locomotive successfully passing over the broken rail or unexpected gap, while the cars behind it are immediately ditched, must have struck every railroad man's attention. By looking over our recent accident reports it will be seen that a large majority of the accidents from broken rails, broken frogs, spreading of rails and "unexplained" causes have the same general result, that the injury is chiefly confined to the cars, although in many of them the engine also leaves the track.

Many causes may be imagined for this comparative immunity of the locomotive, nor is it necessary to suppose that the cause is always the same. In cases of broken rails or spreading of rails, a common and plausible explanation is that the locomotive itself does the damage which derails the train behind it, itself escaping scot-free, but such an explanation does not apply to a case of train-wrecking like the Brazos River accident. The locomotive, furthermore, has not the disadvantage of a derailed vehicle in front of it, to add to the effect of the derailing cause itself; but it seems probable that the main cause, or at least an important cause, is that its tendency to continue in a straight line, when deprived of the guidance of the rails, is much stronger than the tendency of the cars behind it. Most of its weight rests on the driving-wheel base, which is not so constructed that it can swivel around forthwith to nearly a right angle with the line of motion as soon as there is any force tending to cause it to do so and there are no rails to prevent it.

The particular accidents which have furnished the texts for this article occurred on lines which have few or no sharp curves. In the entire Mississippi basin, including nearly half the mileage of the United States, after excluding the mountain regions, the lines are few indeed which have sharper than 6-degree curves on their main line, and many long lines have nothing sharper than 3 or 4 degrees. The sidings have the sharpest curves, and these rarely exceed 10 degrees. Why, then, provide for a necessity which does not exist at the cost of certain increase of a danger which always does exist?

#### Chicago, Burlington & Quincy Earnings and Profits.

The Chicago, Burlington & Quincy gross earnings last December were \$110,561 (5 per cent.) less than in 1883, and the working expenses were \$13,201 (1½ per cent.) more, so that the decrease in net earnings was \$128,762 (10½ per cent.). For six years they have been in December:

Year.	Gross earnings.	Expenses.	Net earnings.
1879.....	\$1,438,167	\$538,442	\$899,725
1880.....	1,552,018	681,412	870,606
1881.....	1,905,490	871,199	1,034,291
1882.....	2,027,060	761,642	1,265,418
1883.....	2,170,918	969,138	1,171,780
1884.....	2,060,357	1,012,329	1,048,018

The gross earnings therefore were larger last year than in any previous year except 1883, the expenses much greater than in any of those years, and the net earnings not only 10½ per cent. less than in 1883, but 17 per cent. less than in 1882.

There were large crops of small grain on the road both in 1884 and 1883, and presumably a heavy movement of it both years; but in 1883 the corn was good only in Kansas and Nebraska, while last year it was good everywhere. But the corn does not make much of a figure in traffic so early as December. West-bound traffic and travel were not so good last December as in most previous years.

For the year ending with December the earnings and expenses of this road have been, for five years:

Year.	Miles.	Gross earnings.	Expenses.	Net earnings.
1880.....	2,512	\$20,454,494	\$9,362,964	\$11,091,590
1881.....	2,812	21,176,456	10,574,391	10,602,065
1882.....	3,099	21,550,805	10,669,341	10,881,464
1883.....	3,255	26,110,369	12,780,630	13,329,739
1884.....	3,350	25,485,671	13,098,568	12,415,133

Compared with 1883 the changes in 1884 were:

	Gross earnings.	Expenses.	Net earnings.
Amount.....	Dec. \$626,698	Inc. \$287,938	Dec. \$914,636
Per cent.....	2.4	2.2	6.9

Compared with all years previous to 1883 there is a large increase in everything.

In the first half of last year there was an increase of \$211,000 in gross earnings, but a decrease of \$122,000 in net earnings; in the last half there was a decrease of \$887,000 in gross and of \$792,000 in net earnings. The decrease in net earnings for the year is equal to \$1.27 per share of stock outstanding, not including the stock issued in 1884, dividends on which will be paid first in 1885.

Actually, however, the first quarterly dividend of 1885 is payable from the earnings of 1884, and the 2 per cent. on the new stock amounts to about \$140,000. Then, in 1883, only one coupon became due on the

\$9,000,000 of bonds issued for Hannibal & St. Joseph stock. The interest account in 1884 must have been about \$202,000 more than in 1883. Thus the surplus over fixed charges, assuming payments for sinking funds, etc., to have been the same both years, was \$1,116,600 less in 1884 than in 1883, the fixed charges having been \$202,000 more and the net earnings \$914,600 less; and, reckoning the first dividend of 1885 as coming from the profits of 1884, the surplus over the dividend of 8 per cent. on the stock was \$1,256,600 less in 1884 than in 1883—about \$1.75 per share of stock.

This would be a formidable matter for most railroad companies, but as the company's surplus over its fixed charges and 8 per cent. dividend in 1883 was \$2,487,646, it is not very important to this one.

For the current year the company will require about \$560,000 more to pay 8 per cent. dividends than was paid out during 1884, but only \$420,000 more than in the above calculation. There is probably no other change in the fixed charges than is caused by the payments into the sinking funds, which will not be important. The amount paid into the sinking funds yearly, however, is an important sum, and though a fixed charge is an addition to the stockholder's profits. The sinking fund payments in 1883 were \$646,480, and at the end of that year the total amount of the sinking funds was \$5,755,130.

As the surplus last year was apparently \$1,231,000, and the requirements this year, so far as known, will be \$420,000 more than last year, a decrease of \$811,000 in the net earnings of the year should still leave enough for the 8 per cent. dividend. Such a decrease would be about 6½ per cent. of last year's net earnings, and less than the actual decrease of net earnings from 1883 to 1884. The road, however, is sure to have a very much greater east-bound freight traffic this year, the country which it serves having had excellent crops of all kinds for the first time in four years, and unless there is a much greater dullness in other business than there was last year even, and more demoralization of rates than in that very bad year (while the signs now point the other way) this road should earn a great deal more than last year. It is, however, well to bear in mind that the surplus over its dividend payments, which has been very large several years, was last year so reduced that, with the increased amount required for the greater capital stock now outstanding, a comparatively small further decrease now would wipe it out altogether.

There are, however, many things concerning this company's welfare not to be ascertained by a bare statement of its net earnings, fixed charges and dividends. It has more than \$25,000,000 invested in the stocks of other railroad companies—the Kansas City, St. Joseph & Council Bluffs, the Burlington & Southwestern and the Hannibal & St. Joseph—which so far have yielded it no income. But the profits of these roads above their fixed charges, when they have any (as they usually have), are not thrown away, but really go towards increasing the value of the shares held in the Chicago, Burlington & Quincy treasury, and this whether the profits are in the shape of cash on hand, of old debts paid, or of improvements of the roads, to which latter purpose most of the profits have been devoted, doubtless. The improvements are expected some time to increase the profits of the roads improved, and if these profits are increased, they will eventually go in the shape of dividends to the chief holder of the stocks, which is the Chicago, Burlington & Quincy Railroad Company. And if these companies run behind and are not able to meet their interest, to protect its stock the Chicago, Burlington & Quincy is virtually compelled to advance money to cover the deficit, as it has had to do sometimes for one of these companies. Therefore it is that we need something more than the full report even of the Chicago, Burlington & Quincy Company to know really how it has thriven in any given year.

#### The Chicago & Alton.

The report of the Chicago & Alton Railroad for 1884 shows that its gross and net earnings were affected less than those of most other railroads by the unfavorable conditions of the year, the decrease having been only 1½ per cent. in gross and 2½ per cent. in net earnings. There was the large increase of 9½ per cent. in freight traffic, but a decrease of 2 per cent. in freight earnings, due to a reduction in the average rate received from 1.128 to 1.007 cents per ton per mile, a lower rate than is received by any other Chicago railroad. The decrease in this average rate since 1882 has been no less than 20 per cent. The passenger traffic increased still more, 13½ per cent., but there was an increase of only ½ per cent. in the passenger earnings, the average fare per mile falling from

2.141 to 1.899 cents, making it lower than on most of the Eastern trunk lines. Only the Erie, the New York Central, and several of the Boston roads with a large suburban traffic, report as low average passenger fares as the Chicago & Alton, which has no suburban traffic. Its average local passenger rate last year was little more than 2 cents a mile (2.153 cents). With this large increase in traffic, equal to more than 10 per cent. in the total, it is not surprising that there was no reduction in the working expenses, such as there has been on most railroads. The increase of more than 10 per cent. in traffic was carried with an increase of very nearly 10 per cent. in the mileage of freight and passenger trains, indicating little change in the average train-loads.

The items of freight in which there was an important increase last year were wheat (23 per cent.), oats (35 per cent.), flour (20 per cent.), lumber (10 per cent.), salt (86 per cent.), cattle (26½ per cent.), and hogs (24 per cent.). On the other hand, there was a decrease of 9½ per cent. in the coal traffic, which heretofore had increased uninterruptedly for many years, the gain from 1878 to 1883 having been 119 per cent. An arrest in the growth of manufacturing industries on the line may have caused the decrease.

A separate statement is given of the earnings from the shipments from local stations of the chief farm products—wheat, corn, oats, cattle and hogs—showing them to be but a small proportion of the total freight earnings, and to be decreasing in amount as well as in proportion to the whole. They were nearly one-fifth of the freight earnings in 1881 and 1882, and but one-seventh of them last year, when they were less than one-tenth of the total earnings. In Illinois the decrease in these earnings has been very large from 1881 to 1884, no less than 34 per cent. The probability is that the earnings from the through shipments of the same articles have been large and increasing. This is indicated by the increase in the total wheat, hog and cattle shipments, and the fact that the production of them in Kansas has greatly increased. But, doubtless, in a country so thickly peopled as that on the lines of this road, the transportation of farm produce yields comparatively but a moderate portion of the total earnings.

With the exception of 1883, both the gross and net earnings of this road were larger last year than ever before, there having been substantially no increase to its mileage since 1880. The increase in net earnings since that year, however, has been small (7 per cent., amounting to \$257,000), though in traffic, meanwhile, there has been an increase of 25 per cent. in freight and 53 per cent. in passengers.

The financial position of this company is very strong. Interest and rentals absorbed about 42 per cent. of the net earnings last year, and after paying \$87,876 into sinking funds and \$292,221 for additions to the property, there remained a profit equal to \$9.33 per share of stock.

This company's road may be said to be on the border between the roads south of Chicago which are compelled to accept something like trunk-line rates, and for the most part make no profits for their shareholders, and those west and northwest of Chicago which get much higher rates and generally earn good dividends. It is especially interesting as a western road which makes good profits at low rates. It has, however, a much denser traffic than any of the great railroad systems north of it, because all or nearly all the latter have a large mileage on the frontier, with undeveloped traffic, while the Chicago & Alton has comparatively little of what may properly be called branches, and all of these are in an old and for the most part a populous country. Last year its traffic was at the rate of 193 passengers and 971 tons of freight each way daily over its entire mileage, which contrasts sharply with the 99½ passengers and 463 tons of freight daily over the Chicago & Northwestern in 1882-83, and is also much superior to the 103 passengers and 633 tons of freight over the Chicago, Burlington & Quincy in 1883. The rates of the latter, however, were nearly as low as those of the Chicago & Alton in 1883.

Most of the Chicago roads will probably have to go through a similar process of reduction in rates, which they will be well able to do if it does not come before the increase of traffic necessary to make such rates profitable. Meanwhile the Chicago & Alton is evidence that an eventual decline of rates to 2 cents per passenger mile and 1 cent per ton-mile does not necessarily prevent a Northwestern railroad from earning good dividends.

The Illinois Central Railroad had a decrease in freight traffic (4½ per cent.) last year and an increase in passenger traffic (9 per cent.), which in the aggregate is equivalent to a decrease of less than 1 per cent.



in total traffic. But a decrease of 4 per cent in the average freight rate and of 8 per cent. in the average passenger rate caused the decrease in earnings to be 6½ per cent., amounting to \$873,910. The working expenses were reduced 4½ per cent. (\$306,760); and this left a decrease of \$567,150, or ¼ per cent., in the net earnings, equal to \$1.95 per share of stock. The train mileage decreased 4½ per cent., or nearly as much as the expenses. Comparisons of traffic with years previous to 1883 cannot be made, as the lines south of the Ohio, of which there are now 711 miles, were then first included. The profits from traffic last year, notwithstanding the large decrease in net earnings, were \$9.42 per share of stock.

Formerly this company had but very small fixed charges to meet. The lease of the Southern lines has greatly increased these, and last year they were (including the rental of the Iowa lines) about 45 per cent. of the net earnings. The direct funded debt of the Illinois Central Company, however, is but \$10,085,000, secured by mortgages on more than 900 miles of railroad in Illinois. The lightness of this debt gives the company good credit, so that it could probably borrow \$10,000,000 at any time on very easy terms. The 5 per cent. bonds of the Chicago, St. Louis & New Orleans, which the Illinois Central guarantees, but which are not secured by a mortgage on any part of the Illinois Central's property, sell at 105 or more.

The report for last year calls attention to the expiration of the lease of one of the Iowa lines, the Dubuque & Sioux City, in October, 1887, and "to the steady diminution in the value of these Iowa lines, both intrinsically and as feeders of the lines in Illinois," which may be regarded as an indication that the Illinois Central is disinclined to renew the lease, at least on the old terms, which have caused a loss in every year of the lease but two or three. But the Illinois Central has expended \$1,321,420 for permanent improvements of these lines. By the terms of the lease, the lessor must pay this back if the lessee does not renew the lease.

The grain exports in January were larger this year than they have ever been before. For five years they have been:

	1881.	1882.	1883.	1884.	1885.
Flour, bbls....	749,441	482,751	385,480	849,606	1,126,921
Wheat, bu....	8,223,300	8,772,611	7,965,396	5,010,880	10,402,190
Corn, bu....	3,101,881	1,650,579	4,170,706	2,551,560	6,878,640
All grains and flour, bu....	14,655,376	9,809,553	15,536,781	11,793,531	22,801,405

In 1881 the wheat and flour exports were larger than they ever had been before in January, but the corn exports were a trifle larger in 1878 than they were this year. But taking all grains together, the exports in 1881 were larger than in any previous year, and yet this year they were 55½ per cent. more than in 1881. This is the more notable because the exports heretofore since the last harvest have not been so great as in several previous years. For the seven months ending with January the exports of wheat and flour reduced to bushels have been for eight years:

Year.	Bushels.	Year.	Bushels.
1877-78	72,142,367	1881-82	84,087,992
1878-79	106,639,373	1882-83	103,569,687
1879-80	121,914,854	1883-84	69,080,501
1880-81	121,628,023	1884-85	83,175,401

Thus the total exports since June this year, after a crop of 513 million bushels, were but 4 millions more than in 1881-82, after a crop of 380 million bushels, 19 millions more than in 1883-84, after a crop of 421 millions, and 20 millions less than in 1878-79, after a crop of 420 millions. They were also 33½ millions (27½ per cent.) less than after the crops of 1879 and 1880, which were 459 and 498 millions respectively. Usually the bulk of the wheat exports is made before January, but the flour exports keep up pretty well till the next harvest. In most years the wheat exports for the five months after January are not one-half as great as for the seven months ending with January.

But while we may expect wheat exports to decrease hereafter, the corn exports should increase. These are usually largest in the spring and summer months, and sometimes two or three times as great in March as in January.

The Chicago through shipments eastward in January last were among the largest ever made in any month. For seven years the January shipments have been, in tons:

1879.	1880.	1881.	1882.	1883.	1884.	1885.
192,512	163,378	263,873	321,148	271,162	213,018	322,073

The shipments in 1884 and this year include shipments from junction points near Chicago, which had been equal to about 9 per cent. of the Chicago shipments. Therefore, the shipments in 1882 were probably considerably greater than this year. Then the shipments were carried for about 10 and 12½ cents per 100 lbs.; this year 20 to 25 for grain, with the average nearer the lower figure, was obtained. The regular rate was 30 cents last year, except for 10 days, when it was 20 cents, and

the average rate received was probably not much more than this year. In 1883 there was a tolerably well maintained rate of 30 cents. The gross earnings from the shipments were probably less this year than in any other year except 1884, 1882, and perhaps 1880, when a 40-cent rate, however, gave nearly as great earnings from about half the traffic.

The shipments last January were exceeded in April and May last, when the rate was 15 cents, but (allowing for shipments of junction points) in no other month except April, 1879 (at 15 cents), March, 1880 (at 35 cents), January, 1882 (at 10 and 12½ cents), and in March, 1883 (at 30 cents).

The shipments seemed likely to be larger in February than in January even, till the snow blockades came, amounting to 95,980 tons in the first week; but in the second week they fell to 41,987 tons. These are the complete figures for actual through shipments of all kinds of freight for the exact weeks. They differ from those reported from Chicago materially, partly because those reported from Chicago probably do not cover the last day of the week reported, partly because they do not cover the freight other than flour, grain and provisions, which, however, is not much more than 1 per cent. of the whole, and partly probably because they do not cover the loaded cars transferred from western to eastern roads at such junction points as Joliet, Matteson, etc.

#### January Accidents.

Our record of train accidents in January, given on another page, contains notes of 47 collisions, 92 derailments, and 6 other accidents; 145 accidents in all, in which 24 persons were killed and 182 injured.

Seven collisions and 10 derailments caused death, 11 collisions, 28 derailments and one other accident injury. In all 17 accidents caused death and 40 lesser injuries, leaving 88, or 61 per cent. of the whole number, in which no serious injury to persons is recorded.

In the 47 collisions 10 persons were killed and 35 hurt; in the 92 derailments 14 were killed and 153 hurt; the 6 other accidents killed no one, but injured 4 persons.

Of the killed 18 and of the injured 57 were railroad employees; 75 per cent. of the deaths, 31 per cent. of the injuries, or 36½ per cent. of all the casualties, thus falling to this class.

As compared with January, 1884, there was a decrease of 2 accidents, of 32 killed and of 58 injured.

These accidents are classed as to their number and causes, as follows:

COLLISIONS:	
Rear .....	29
Butting .....	14
Crossing .....	4
DERAILMENTS:	
Broken rail .....	23
Broken frog .....	1
Broken switch-rod .....	6
Broken bridge .....	2
Spreading of rails .....	6
Broken wheel .....	5
Broken axle .....	2
Broken truck .....	1
Dropped brake-beam .....	3
Accidental obstruction .....	1
Land-slide .....	1
Wash-out .....	2
Snow or ice .....	9
Wind .....	1
Misplaced switch .....	1
Furiously misplaced switch .....	3
Malicious obstruction .....	1
Unexplained .....	16
OTHER ACCIDENTS:	
Boiler explosion .....	1
Flues collapsed .....	1
Broken parallel-rod .....	2
Broken tire, not causing derailment .....	1
Broken truck, not causing derailment .....	6
Total .....	145

Six collisions were caused by trains breaking in two; three by snow; two by misplaced switches; one each by fog, by a mistake in orders and by a runaway train.

A general classification of these accidents may be made as follows:

	Collisions.	Derailments.	Other.	Total.
Defects of road .....	7	38	0	38
Defects of equipment .....	30	11	6	45
Negligence in operating .....	4	9	0	13
Unforeseen obstructions .....	4	14	0	18
Maliciously caused .....	0	16	0	16
Unexplained .....	0	0	0	0
Total .....	47	92	6	145

Negligence in operating is charged with 31 per cent. of all the accidents; defects of road with 26, and defects of equipment with 16½ per cent.

A division according to classes of trains and accidents is as follows:

	Collisions.	Derailments.	Other.	Total.
To passenger trains .....	6	41	4	51
To a pass. and a freight .....	8	0	0	8
To freight trains .....	33	51	2	86
Total .....	47	92	6	145

This shows accidents to a total of 192 trains, of which 85 (34 per cent.) were passenger trains and 127 (66 per cent.) were freight trains.

Of the whole number of accidents, 84 are mentioned as happening in daylight and 61 at night.

The number of accidents is larger than for any month of last year except January, and is readily explained by the severe weather and the storms of the latter half of the month. Aside from the derailments directly caused by snow, the

effect of the weather is seen in the large number of broken rails reported, forming one-fourth of the whole number of derailments, and causing several serious accidents.

Apart from these there is but little in the record which calls for comment. The number of collisions was hardly as great as might have been expected in a month when a traffic of many lines was interrupted and the train service deranged by storms, and accidents from other causes were somewhat fewer in number than usual.

For the year ending with January the record is as follows:

	Accidents.	Killed.	Injured.
February .....	110	22	150
March .....	115	26	112
April .....	88	19	108
May .....	76	32	150
June .....	71	40	103
July .....	89	25	142
August .....	69	38	112
September .....	100	21	174
October .....	105	39	170
November .....	96	47	130
December .....	105	24	109
January .....	145	24	182
Total .....	1,180	357	1,702
Total, same months, 1883-84 .....	1,619	474	1,854
" " " 1882-83 .....	1,395	394	1,589
" " " 1881-82 .....	1,372	425	1,613

The yearly average for the four years was 1,394 accidents, 413 killed and 1,715 hurt. The monthly average last year was 99 accidents, 30 killed and 142 injured.

The averages per day for the month, were 4.68 accidents, 0.77 killed and 5.87 hurt; for the year they were 3.25 accidents, 0.97 killed and 4.68 injured.

The average casualties per accident were, for the month, 0.166 killed and 1.255 hurt; for the year, 0.300 killed and 1.431 injured.

Mr. A. P. Smith writes us to correct a paragraph on "Brooklyn Bridge Coal Consumption," which appeared in the *Railroad Gazette* of Feb. 6 last. In the statement from which it was copied, "engine duty required to run the machinery and cable" should have read 45.6, instead of 35 horse-power, the latter being the amount of the cable friction only, exclusive of the machinery friction of 10.6 horse-power. Furthermore, the "six tons per day" burned were tons of 2,000 lbs., and not the usual wholesale coal ton of 2,240 lbs. Allowing 6 lbs. per ton of weight of empty cars for their friction, in addition to the cable and engine friction, the work of moving the cars alone amounts to 14.52 horse-power, which makes the coal consumption per horse-power of apparent work 10.0 lbs., whereas without the corrections we have the impossibly high figures, for a large modern stationary engine operating under favorable conditions, of 13.6 lbs.

Mr. Smith says that the coal burned per indicated horse-power (the latter being from 95 to 125 horse-power) is really about 5 lbs. If so, the increased friction of cable and engine due to the attachment of the cars, doubles the apparent call for power, which is a much more unfavorable result than on other cable roads, so far as can be judged from somewhat indefinite statistics. The bridge cable is short, however, with many turns, and no doubt the intermittent nature of its duty puts it under great disadvantage; but the direct and indirect friction due to the cars must amount to 20½ lbs. per ton (2,000 lbs.) of their weight to account for the power used, at 5 lbs. per horse-power. The cars are, to be sure, given a velocity of 10 miles per hour (equivalent to lifting them 3.34 ft.) by the cable, but this latter for 2,400 cars per day, amounts to only four horse-power, or 1.1 lbs. per ton out of 20½ lbs.

Leading officers of the mechanical department of the Vanderbilt system, and its New England outlet, including Messrs. Buchanan, Kirby, Adams, and Miller, have recently agreed on a standard form for the Ames coupler, in consultation with the owners of the patent, by which the Ames draw-bar is reduced to a width of 9 in., instead of 12 in., so that it can be used for repairs of any cars not having the centre sills nearer together than 9 in. Two other slight changes were made, enabling the cars to be uncoupled by either lever (on either side and facilitating throwing the coupler out of gear for yard work.

The snow blockades have resulted in a great decrease in the grain movement since the first week of February, which, curiously, seems to have been about as great at St. Louis, where the snow has not been a serious obstruction, as at Chicago, which on some days has been almost unapproachable. Thus the decrease at Chicago from the first to the second week of February was 54 per cent. in wheat and 45½ per cent. in corn; at St. Louis, 52½ per cent. in both wheat and corn. It should be observed, however, that the corn receipts in the first week of February were extraordinarily large.

The total grain receipts of the eight Northwestern markets (St. Louis, Peoria, Chicago, Milwaukee, Duluth, Detroit, Toledo and Cleveland) for the six months ending Feb. 14 have been, in each of the last six weeks:

Jan. 16.	Jan. 17.	Jan. 24.	Jan. 31.	Feb. 7.	Feb. 14.
4,726,675	5,024,532	4,811,933	5,625,338	7,370,601	3,778,694

The comparison of the second with the first week of February shows an enormous decrease, but the receipts in the first week were much larger than ever before in a winter week, and the decrease from January weeks is not formidable. The incomplete reports for the third week of February so far received indicate a decrease of about 900,000 bushels from the receipts of the second week.

The shipments from the Northwestern markets have not been affected so much as their receipts, having been for six weeks:

Jan. 10.	Jan. 17.	Jan. 24.	Jan. 31.	Feb. 7.	Feb. 14.
2,815,589	3,830,355	2,587,028	3,379,480	3,800,700	2,617,505

For the week ending Feb. 21 the reports indicate the ship-



ments to have been several hundred thousand bushels less than the week before.

Down to the middle of February the effect of the blockades is not visible in the receipts of the Atlantic ports, which, indeed, were larger in the second week of February than in any other week of the year. This is because the railroads then were delivering part of the enormous shipments of the Northwestern markets made in the previous week. Last week the Atlantic receipts were probably much reduced.

The second week of the snow blockade, ending Feb. 21, further reduced the Chicago shipments, the railroads both east and west having their capacity greatly reduced. For this week and corresponding weeks of five previous years the through shipments of flour, grain and provisions from Chicago have been, in tons:

	1880.	1881.	1882.	1883.	1884.	1885.
49,780	48,921	57,662	61,533	45,014	59,837	

Thus the shipments this year were 11½ per cent. less than last year, when they were less than in any previous year, including 1881, which was the worst year for snow blockades the Northwest has ever had.

For six successive weeks the shipments and the percentage going by each road have been:

Tons.	Jan 17.	Jan 24.	Jan 31.	Feb. 7.	Feb. 14.	Feb. 21.
Flour	10,905	7,347	14,914	19,219	11,282	8,906
Grain	42,977	32,905	50,340	52,131	30,913	22,887
Provisions	13,171	10,088	10,433	10,025	3,846	8,444
Total	67,053	50,330	75,737	81,375	46,041	40,237
Per cent.:						
C. & Grand	15.8	11.0	6.5	7.0	6.4	2.0
Mich. Cen.	29.0	24.4	29.0	8.3	5.8	15.3
Lake Shore	12.3	17.7	21.3	29.4	26.0	19.7
N. & W. Plate	8.3	6.4	4.5	3.3	7.4	7.1
Fort Wayne	7.7	8.8	13.6	20.0	12.8	20.8
C. St. L. & P.	8.4	14.4	7.0	11.0	19.8	12.0
Blt. & O.	6.3	3.6	7.4	7.8	6.2	9.6
Ch. & Atl.	12.2	13.7	10.7	13.2	15.6	14.1
Total	100.0	100.0	100.0	100.0	100.0	100.0

Thus, while there was a decrease of 21 per cent. in flour and of 26 per cent. in grain from the second to the third week of February, there was an increase of 109 per cent. in provisions, the shipments of which were but a fifth less than in the first week of February, when the total shipments were largest.

The percentages again show the effect of the snow. Apparently the Chicago & Grand Trunk was not completely blockaded, and the lines south of the Michigan Central suffered least. The Fort Wayne seems to have carried for the Pan-Handle last week, as the Pan-Handle carried for the Fort Wayne the week before. The shipments by the Chicago & Grand Trunk were, in amount, but one-thirteenth as great as in the week ending Jan. 17. The blockades have tended to assist in bringing down the percentages of the roads which were "over" most—the Chicago & Grand Trunk and the Michigan Central—and the first of these may be "short" instead of "over" by this time. The three Vanderbilt roads together carried 42.1 per cent. of the whole last week, and the two Pennsylvania roads 32.8 per cent.

There must have been at the close of last week nearly 10,000 cars of freight on the western roads within a few hours of Chicago, mostly on side tracks, waiting till they can be forwarded by the eastern roads. As soon as these are fairly clear and can command their motive power, extraordinarily large shipments for a week or two may be expected.

An unofficial statement of the working expenses of the Chicago & Northwestern Railway for the seven months ending with December has been published by the *Commercial and Financial Chronicle*, which routes for its correctness. From this it appears that the gross and net earnings and working expenses for these seven months for four years have been:

	1881.	1882.	1883.	1884.
Gross earn.	\$15,112,925	\$15,405,940	\$16,348,171	\$14,819,445
Expenses	7,021,955	7,957,586	8,923,501	7,866,183
Net earn.	\$8,090,970	\$7,448,354	\$7,424,670	\$6,953,262

Compared with last year the decreases are:

	Gross earn.	Expenses.	Net earn.
Amount.	\$1,528,726	\$1,057,318	\$47,408
Per cent.	10.4	11.8	6.3

The mileage has increased but moderately since 1883, but very largely since 1881, from 2,900 to 3,850 miles, or 31 per cent., in spite of which there has been a decrease of \$293,000 in gross and of \$994,000 in net earnings, and the earnings and expenses per mile for the seven months have been:

	1881.	1882.	1883.	1884.
Gross earnings	\$5,211	\$4,599	\$4,360	\$3,849
Expenses	2,421	2,432	2,433	2,043
Net earnings	\$2,790	\$2,167	\$1,929	\$1,806

The gross earnings per mile were thus 26½ per cent. and the net earnings 35 per cent. less in 1884 than in 1881.

In view of the great decrease in gross earnings, the decrease in net earnings since 1883 is small, and the decrease in working expenses is very large. The great crops of wheat and oats, most of which are marketed before January, seem not to have improved the earnings, as about half the decrease occurred after harvest. But for the remaining five months of the fiscal year the road will have what it has not had for three years previous, a very large corn crop to move, and in that respect will have a great advantage over last year. Then 30 per cent. of its net earnings were made in these five months from January to May, inclusive, and in each of the two previous years 28 per cent. The first two months can hardly have been favorable, as there has been a decrease in gross earnings in them, though not so great as in preceding months, and if the reduction of working expenses has been maintained, there has been an increase in net earnings; but it is never until after February that there is a considerable corn

movement on this road. Indeed it does not become very large until May, which is the last month of the fiscal year, and on this account it may not much affect the earnings of this year.

If 30 per cent. of the net earnings of the fiscal year are made in the last five months of it, as last year, they will be \$9,925,847, against \$10,552,289 last year. These were not unfavorable months last year, but the gross earnings were nearly the same as in 1883 and larger than ever before.

The Pennsylvania Railroad Company reports for January smaller gross earnings on its lines east of Pittsburgh and Erie than in any previous year since 1881, and smaller net earnings than in any other year since 1878. For 13 years the earnings and expenses of these lines have been:

January Earnings and Expenses, Pennsylvania Railroad.

	Gross earnings.	Expenses.	Net earnings.
1873	\$2,754,284	\$2,194,632	\$559,652
1874	2,856,165	1,736,489	1,119,676
1875	2,200,359	1,630,767	569,592
1876	2,447,625	1,681,780	765,845
1877	2,383,566	1,656,044	727,522
1878	2,396,297	1,518,098	878,199
1879	2,513,424	1,523,893	1,019,531
1880	3,083,551	1,717,253	1,366,298
1881	3,189,215	1,987,374	1,201,841
1882	3,373,321	2,249,055	1,074,266
1883	3,329,357	2,458,209	871,148
1884	3,574,229	2,408,647	1,165,582
1885	3,277,522	2,286,948	990,574

The decreases from last year are:

	Gross earn.	Expenses.	Net earn.
Amount.	\$90,711	\$111,149	\$175,532
Per cent.	8.3	5.0	15.1

The decrease in gross earnings is much greater than in December, but less than in October and November; and the decrease in net earnings is also less than in those months, but greater than in any other since February of last year. Compared with January, 1883, there is a decrease of 16.6 per cent. in gross, and of 33 per cent. in net earnings. It is evident that the heavy movement of through freight from the West to the East last January did not profit this railroad much, or that there were great losses in other traffic.

The lines west of Pittsburgh and Erie last January showed a deficiency of \$73,420 in meeting all liabilities, which is a slight improvement over last year, but a loss compared with previous years. For seven years the surplus or deficit in January of this western system has been:

	Surplus.	Deficit.
1879	\$161,637	\$221,800
1880	305,304	110,585
1881	381,307	73,420
1882	42,748	

Adding the surplus to and subtracting the deficit of this western system from the net earnings of the eastern system, we have as the company's profits from the two systems:

1879.....	\$1,181,158	1883.....	\$1,092,858
1880.....	1,671,002	1884.....	1,050,551
1881.....	1,588,008	1885.....	912,154
1882.....	1,117,014		

The decrease from last year is \$138,397, or 15½ per cent.; from 1883 it is \$780,704, or 46 per cent. The decrease from last year is about 14 cents per \$100 of stock.

#### Record of New Railroad Construction.

Information of the laying of track on new railroads in the current year is given in the present number of the *Railroad Gazette* as follows:

*Lehigh Coal & Navigation Co.*—A branch of this company's *Nesquehoning Valley* road is completed from near Tamamond, Pa., to a junction with the East Mahanoy road, 3½ miles.

*Wrightsville & Tenville.*—Extended south to Wrightsville, Ga., 1½ miles.

This is a total of 5 miles, making 107 miles thus far reported for the current year. The new track reported to the corresponding date for 14 years past has been:

	Miles.	Miles.
1885	107	198
1884	184	82
1883	220	224
1882	452	86
1881	199	164
1880	497	304
1879	9	201

This statement covers *main track only*, second tracks and sidings not being included.

#### NEW PUBLICATIONS.

*Catalogue of Osgood Dredge Company.* Albany, N. Y.

*Balance Slide-Valves.* F. W. Richardson, Troy, N. Y.

The new edition of the catalogue of the Osgood Dredge Company preserves and somewhat extends the admirable qualities of which we spoke in reviewing the last edition. It gives full detail drawings and descriptions of the various machines, with records of actual work, so that the reader is enabled to judge for himself of the merits of the machine without having to rely on meaningless or indefinite pictures and laudatory certificates, which so often and so justly carry little weight. The same merits, on a smaller scale, are noticeable in the smaller catalogue referred to.

The implication, in catalogues of this kind, is, of course, that all which is necessary to command the goods referred to is to have their features fully understood in detail. The implication may not always be a sound one, but it is at least a shrewd one to convey, from a business point of view, and it also renders far more probable the preservation of the catalogue.

*Curce Tracing in Cartesian Co-ordinates.* By Prof. W. W. Johnson, United States Naval Academy. New York, John Wiley & Sons.

It is to be hoped that no one, misled by its title, will purchase this book as one having to do with railroad field work. It deals with some of the higher problems of analytical

geometry, quite clearly and simply it would seem, and those having a fondness for that study will find it admirably adapted to test their knowledge. It employs a neat device called the "analytical triangle," which enables the curves to be more readily studied, but the curves considered are by no means circular arcs, and have no reference to railroad practice.

#### Notes in Virginia.

##### III.

#### THE ROANOKE MACHINE WORKS.

These works are owned by a stock company which contracts to execute all repairs needed for the rolling stock and locomotives of the Norfolk & Western Railroad, and is also prepared to build locomotives and cars for other lines.

Roanoke is situated in the southwestern portion of Virginia, some 240 miles west of Norfolk, in the valley between the mountain ranges of the Alleghenies and Blue Ridge. Three years ago, the village near the site of the Big Lick Works was known as Big Lick, and contained about 600 inhabitants. The town of Roanoke has now a population of about 6,000, and besides the locomotive and car works, the general offices of the Norfolk & Western and the Shenandoah Valley railroads are situated here, while the Crozier blast furnace and iron mines are in immediate proximity, and various smaller industries, such as tobacco factories, etc., have sprung up in the town. The site was bought and laid out by the Land & Improvement Co., which sold or leased lots to occupiers.

In this respect it differs from Pullman, a town of somewhat similar growth, situated round a great industrial establishment. There the Pullman Company retain full control, none of the land being sold to occupiers, but let on leases, terminable at short notice at the option of the Pullman Company. At Roanoke the ordinary principle of individual enterprise and local self-government are relied upon to build up a prosperous and industrious community, with apparently good results. The town possesses several churches, a large and handsome hotel, which we understand is always well filled, and a large stone schoolhouse is being built. A plentiful supply of clear water is brought from a spring some three miles off, and is pumped into elevated tanks so as to give a pressure in the works and all over the town. This water supply and a system of main drainage, which is now nearly completed, will, it is hoped, prevent any recurrence of fever and malaria, which last year hindered the progress of the young community. Most of the inhabitants are not natives of Virginia, many of those employed on the works having come from the Pennsylvania Railroad, and being natives of that state. Other Northern states, and England, Germany, France, Poland and Holland have also contributed their quota.

The works are fine substantial brick buildings, mostly with iron-framed roofs, and are well equipped with machine tools, cranes, hydraulic riveters, etc. The locomotive erecting shop measures 530 ft. x 62 ft., and is provided with two overhead traveling cranes running the whole length of the shop. The engines are erected at one end, and the boilers are made at the other end of the shop. Besides the usual equipment of a boiler shop, punching and shearing and plate-planing machines, the shop is provided with a complete hydraulic riveting plant (Tweddell's patent). Across one end of the shop, close up to the roof, runs a stout lattice girder from which a locomotive or other boiler can be slung by means of blocks and chains worked by an hydraulic ram. The boiler can thus be suspended over the large fixed hydraulic riveter, and its position shifted for each rivet with great ease and exactness. Portable riveters are also used for the fire-hole and other parts which cannot be conveniently got at by the fixed riveter.

The machine shop has a walking jib crane running down the centre between the heavier tools, and is well equipped with modern machine tools by the best-known makers.

The wood-working machines in the car shop are made by Loudon, Kelley & Orton, of Philadelphia, and are provided with a complete system of exhausters for chips and sawdust.

The stores are very large and complete. They contain some of the old books of the company (then the Virginia & Tennessee) kept during the war. Running a railroad must then have been somewhat expensive. A keg of spikes is entered at \$150, files are charged \$5 each and \$30 was the regular price for a pair of shoes. The books do not relate whether trainmen's pay was advanced proportionately.

One of the most important features of a modern locomotive or car-works is a good office and staff. All details can then be carefully worked out there, and improvements during the progress of the design can be made on paper, a much cheaper process than making alterations in finished or half-finished work. This feature seems to have received especial attention at Roanoke, the drawings being very clear and complete, while the neat and workmanlike appearance of the engines is doubtless due to a great extent to the care taken in working out each individual detail on the drawing-board.

The blue-printing frame is provided with a neat little contrivance to keep the tracing and blue print close together and pressed flat against the glass without air bubbles or wrinkles. Between the back of the frame and the blue-print is a large rubber bag, which, when inflated, gives a considerable pressure, uniformly distributed all over the blue-print and tracing, and keeps them perfectly smooth and in close contact. This is an important item in making a good blue-print.

The car-erecting, repair and paint shop occupies an arc of a circle round a large turn-table 100 ft. long and capable of holding a light switcher and a couple of freight cars. The turn-table is moved by an engine attached to it near one end by means of links, so that the wheels carrying the engine always bear on the turn-table rails, whether the ends of the



turn-table are clear of the turn-table path or not. The engine has thus always adhesion to turn the table.

Both this and the engine turn-table are iron trusses, built above instead of below the rail level. A very deep and stiff truss is thus secured with a shallow excavation. The engine turn-table is made just long enough (75 ft.) to avoid the use of frogs on the tracks leading to the engine stalls.



Roanoke being situated at the junction of the Norfolk & Western, a road on the 5 ft. gauge, and the Shenandoah Valley, on the 4 ft. 8½ in. gauge, many special arrangements are necessary to suit the two gauges. The truck hoist for passenger cars is situated close to the works and passenger depot, and that for the freight cars a mile south of the depot. Though the main freight traffic is east and west, that is, to and from Norfolk, and needs no change of gauge, the immense number of trucks standing idle awaiting cars that have gone north and south, gives a vivid idea of the inconvenience and loss caused by the break of gauge. The cars are hoisted by large square-thread screws driven by steam, the screws carrying nuts provided with swinging arms which bear against the under side of the car sills. The trucks are wheeled away and put on a transfer table, which places them on another transfer table at right angles to the first, whence they are transferred to short cross tracks right and left of the transfer-table bed. A record is kept of the track on which each truck is placed, and every truck is marked with the number of the car to which it rightfully belongs, if that has not been already done. Thus, as far as possible, each car on returning can be replaced on its own trucks. Differences in centre and side bearings often cause inconvenience in running with trucks which were not built for the car.

The hemispherical centre-plate used by the Pennsylvania and Pullman\* companies is found very convenient in changing trucks. In lowering a car on the trucks, the rounded surfaces guide one plate into the other, while the ordinary plates must be in exactly the proper relative position or they will not enter.

The different gauges of tracks in the yard necessitate some special arrangements of switches and frogs. A simple form of fixed switch is used to sort the broad and standard-gauge trucks, turning them on distant tracks. In some places three rails are used, and in others a compromise gauge, 4 ft. 11½ in., with guard rails and wide-throated chilled cast-iron frogs, slightly grooved for the wheel flanges. The four-wheeled yard switching engine appears to run over these frogs without derailment.

A fine passenger engine, the first of a class, had just been completed the day of our visit. It is a ten-wheeler, and is intended to take heavy passenger trains over the long grades crossing the Blue Ridge and the main divide of the Alleghenies. The permanent way is at present in excellent condition, and as it seemed desirable to keep it so, it was resolved in building heavier and more powerful engines to obtain increased adhesion by an additional pair of drivers rather than by adding to the weight on each individual wheel. The cylinders measure 19 in. x 24 in., and the drivers are 63 in. in diameter on the tread. The fire-box is of the Belpaire type.† The fire-door is in two halves, made to slide horizontally and simultaneously by the movement of a handle. The opening is always central and its amount can be regulated to admit any desired quantity of air.

In designing a ten-wheel engine, it is generally difficult to avoid either very short or bent eccentric rods, and therefore it was in contemplation to use Joy's or Strong's valve gear, both of which dispense altogether with eccentric rods. But with the limited space available between the wheels, it was found difficult to make a satisfactory arrangement of these gears at a moderate cost, though Strong's gear, as arranged on a full-sized wooden model, gave an excellent distribution of steam, and the ports were opened and closed very quickly. Ultimately, a very neat and ingenious arrangement of the ordinary link motion was adopted.

The centre line of the motion is inclined upward at a considerable angle from the centre of the driving-axle, and works a rock shaft which does not reverse the motion, but simply transfers the motion from the inside to the outside of the frames. The two arms, instead of being opposite one another, thus, , as in the usual rock shaft, are placed thus, , the die-block is not coupled directly to the rocker arm, an intermediate valve rod being used, which is hung in an ingenious manner not easily described without a drawing.

The motion is reversed by means of Goode's patent steam reverse gear. The valves have the Allen passage and the Delaney balancing device.

The bumper between engine and tender is provided with a wedge acting in a horizontal plane, which can be drawn up so as to take up any slack between engine and tender.

Mr. Charles Blackwell, the Superintendent of Motive Power of the Norfolk & Western and Shenandoah Valley, has been remarkably successful in effecting an economy in the amount of fuel burned in his engines. Judicious experiments, especially with various forms and heights of blast nozzles, have largely diminished the amount of coal burnt per mile, while the quantity of water evaporated per pound of coal has been largely increased. This improvement has been carried still further by the use of larger grates and fire-boxes in new locomotives, and by the employment of consolidation engines on the division crossing the Alleghenies and Blue Ridge. As we intend to give detailed figures as to the relative coal consumption in an early issue, it is hardly necessary to say more on this point at present, except that the Norfolk & Western engines run with an

absence of smoke and sparks which contrasts very favorably with neighboring lines burning a similar quantity of soft coal. The results attained should encourage those on other roads who are trying to build an engine that will burn soft coal without emitting dense smoke or throwing fire. If these great sources of waste can be prevented on one line, they can at least be mitigated on others.

#### Transportation in Congress.

In the Senate on the 19th:

The bill to forfeit the Texas & Pacific land grant was taken up.

Mr. Morgan offered an amendment similar to that offered by him in the case of the Atlantic & Pacific bill, providing for a reference to the United States Courts of all controversies concerning the rights and equities claimed by the United States or by private parties in the lands forfeited. He addressed the Senate in support of his amendment. He stated his conviction that the grant should be forfeited and that the question presented by his amendment was one of policy. The debate upon the amendment and the bill proper was very lengthy. The amendment was rejected—yeas, 24; nays, 31; and the bill was passed—yeas, 52; nays, 2; those voting in the negative being Messrs. Blair and Bowen.

The bill as passed provides, in substance, that the whole of these lands shall be restored to the public domain and made subject to disposal under the general laws of the United States, as though the grant had never been made; provided that the price of the lands so forfeited and restored shall be the same as heretofore fixed for the even sections within the grant.

In the Senate on the 23d:

Mr. Sherman (Ohio) introduced to the Pacific Railroad Sixty-year Funding bill an amendment to the effect that no dividend shall hereafter be made upon the stock of either of the railroad companies named in the act, except from the net earnings within one year preceding each dividend, after all interest and other fixed charges shall have been paid or provided for, and the current expenses of running the road shall have been paid. That whenever it shall appear that the net earnings of either of the companies shall, during one year preceding, amount to more than 6 per cent of the capital stock, one-half of such excess shall be paid to the United States on the debt of the company, and the other may be divided among the stockholders or applied for the betterment of the road.

In the House on the 23d:

On motion of Mr. Payson (Illinois), the Senate amendments to House bill forfeiting the Texas & Pacific land grant, were concurred in. The bill now goes to the President. The land grant forfeited is that given for the road from El Paso to San Diego, which the Texas & Pacific never built, but which it proposed to transfer to the Southern Pacific Co., which built most of the line. The land grant east of El Paso was from the state of Texas, not from the United States.

#### TECHNICAL.

##### Locomotive Building.

The Mason Machine Works, in Taunton, Mass., last week delivered to the Old Colony road a shifting engine with 16 by 24 in. cylinders, and a double-truck tank engine with 16 by 24 in. cylinders, for local passenger service. They are also building for the same road two freight engines with 18 by 26 in. cylinders.

The Roanoke Machine Works, at Roanoke, Va., have under construction 9 consolidation freight locomotives, 3 passenger engines, and 3 heavy shifting engines for the Norfolk & Western road.

The New York Central shops at West Albany, N. Y., are building 3 passenger engines with 17 by 20 in. cylinders and 5 ft. 8 in. driving wheels, to be used on the fast passenger trains.

The Brooks Locomotive Works, in Dunkirk, N. Y., recently delivered a freight engine to the Indiana, Illinois & Iowa road.

##### Car Notes.

The Bradley car shops, in Worcester, Mass., have just completed two very handsome passenger cars for the New York, Providence & Boston road.

The Pullman car shops at Pullman, Ill., are to build six ordinary sleeping cars and six buffet cars for the Baltimore & Ohio road.

The Westinghouse Air Brake Co., in Pittsburgh, has received an order from the Union Pacific to equip 900 freight cars with its continuous freight brake.

It is proposed to establish car works on an extensive scale at Nashville, Tenn., provided sufficient subscriptions are secured to the stock.

##### Iron Notes.

Robesonia Furnace, in Berks County, Pa., has been sold to William R. White and Mrs. Henry Borie, of Philadelphia, for \$870,000. The furnace company has a perpetual right to mine all the ore it may require from the Cornwall iron banks free of charge, and this franchise is considered a very valuable one and accounts for the high price paid for the property.

At the Edgar Thomson Steel Works, at Braddock, Pa., 4 of the blast furnaces are now in operation. The fifth furnace is being repaired.

The McDonald steam forge and rolling mill, in St. Louis, has resumed work, both in the rolling mill and the forge. The Chicago Forge and Bolt Co. is running its works at South Chicago full double-time.

Jefferson Furnace, at Auburn, Schuylkill County, Pa., will go into blast March 1, after a suspension of four months.

Victoria Furnace, in Rockbridge County, Va., goes out of blast this week, and the mining of ore will be suspended at the same time.

##### Manufacturing and Business Notes.

The firm of Bagnall & Loud, of Boston, was dissolved Feb. 14, and the business transferred to the Bagnall & Loud Block Co., a corporation organized with a capital of \$150,000. The new company will carry on the business at the old location, but with improved facilities. Its officers are Edward O. Loud, President; Herbert Loud, Treasurer and Manager.

The patent plumbago journal-bearing metal manufactured by J. J. Ryan & Co., of Chicago, is used on the Kansas City cable line and on the Third Avenue cable line in New York City. They have also sent a lot to San Francisco for use on the cable road in that city. On these lines it is used for journals on the bearing pulleys, and has the advantage that there is no oil in the bearings to thicken or freeze in cold weather. This metal has been used with good results on line shafting, and some bearings are now being tested under railroad cars, but no reports have yet been received from them.

The New York Engineering Co., a new concern, will after March 2 occupy a store at No. 64 Cortlandt street, New York, doing a general engineering business. The company controls a large foundry and machine shop in the vicinity of New York, and will design and construct machinery of all

kinds. Mr. John A. Caldwell is the Secretary of the company and will have charge of the office.

##### The Rail Market.

**Steel Rails.**—The *Iron Age* says: "There has been more business on the market than for some time, and quite a number of orders entered, although none of special importance. Lots of a few hundred up to 1,000 tons each have been taken at prices ranging from \$28 at mill down to about \$27.50, with a probability that still lower figures would be accepted on larger lots. There is considerable inquiry for 40 lb. rails, which are quoted at about \$29 at mill, but deliveries are such that the orders are likely to be taken by mills west of the Alleghenies. Meanwhile, those in the East are tolerably well filled up, and with the current demand for small lots are likely to have full employment during the spring and summer months."

**Rail Fastenings.**—Prices are nominally unchanged at 1.90 @ 2 cents per pound in Pittsburgh for spikes; 2.25 @ 2.65 cents for track-bolts, and 1.65 @ 1.75 cents for splice-bars. The market is very dull and actual prices uncertain.

**Old Rails.**—The market for old iron rails is firmer at \$17.50 @ \$18 per ton at tidewater. Old steel rails are quoted at \$15.50 @ \$16.50 per ton in Pittsburgh.

##### Car Couplers.

The Fitchburg Railroad Co. has adopted the Cowell car coupler for its freight equipment. This is a hook coupler, and the Fitchburg is the only Massachusetts company which has yet adopted it.

The Old Colony Railroad Co. has adopted the United States car coupler as the standard for its freight cars.

The Boston *Advertiser* says of the Ames automatic coupler: "The coupler itself costs \$20 a car if made of steel, and \$18 if made of malleable iron. In building a car the timbers are placed farther apart, so as to permit two springs abreast. In old cars, the timbers being but 9½ in. apart, an alteration is required, but the Ames coupler can be applied for about the difference in cost between the draw-bars. The Boston & Albany Railroad Co. has bought the right to use this coupler, in connection with the New York Central, the Lake Shore & Michigan Southern, and also the Michigan Central, the whole line having about 100,000 cars. Whoever desires information as to the method of applying and the success in working this coupler can undoubtedly obtain it of the Boston & Albany."

\* \* \* There are two Ames couplers. The one referred to in yesterday's *Advertiser* is the one with a combined hook and link that has been in use for some years on the Boston & Albany. The other is owned by the Ames Automatic Car Coupling Co., of this city. It consists of a hook in the draw-head, which drops into the common loose link. This is a Canadian invention of recent date, and is being tried on the Boston & Lowell."

##### British Rail Exports.

For the month of January these have been, for three years:

	Iron rails.			Steel rails.		
	1883.	1884.	1885.	1883.	1884.	1885.
To United States...	131	.....	.....	5,962	1,713	166
To other countries...	3,114	832	1,269	62,314	36,831	28,397
To all countries.....	3,245	832	1,269	68,276	38,544	28,563

The decrease in shipments to all countries is 30 per cent. since 1884 and 60 per cent. since 1883. No shipments to any European country are reported. The largest decreases are in the exports to Brazil and India.

##### Engineers' Club of St. Louis.

The club met in St. Louis, Feb. 4, Vice-President McMath in the chair, 30 members being present.

The Executive Committee reported the names of the following gentlemen, who were unanimously elected: C. W. Clarke, F. L. Foot, F. B. Maltby, A. J. Sypher and John G. Kelly.

Mr. Wm. Wise then read a paper on Mill Creek Sewer, which was discussed by Messrs. Ockerson, Holman, Sedden, Whitman, Woodward and H. C. Moore.

Mr. J. B. Johnson presented discussions of Creeping of Rails, by Mr. Theodore Cooper, of New York and Mr. John A. Wilson, of Philadelphia.

The Club then adjourned.

##### Engineers' Club of Philadelphia.

At the regular meeting in Philadelphia, Feb. 7, Past-President Frederic Graff in the chair; 46 members and 3 visitors present.

Mr. M. Van Harlingen presented a full description of the Phoenixville tunnel on the Pennsylvania Schuylkill Valley Railroad, illustrated by drawings and photographs.

The Secretary presented, for Mr. A. Harvey Tyson, a paper upon the Sources of Pollution in Storage Reservoirs, giving his experience as City Engineer of Reading, Pa., with the water supply of that city, and also a detailed account of the trouble in the Baltimore water supply and his correspondence and experiments with Mr. Robert K. Martin, Chief Engineer. The paper was discussed by Dr. H. M. Chance.

Mr. E. V. d'Inville mentioned an article, to which his attention had been called by Prof. L. M. Haupt, upon the Repairs to Chestnut Street Bridge, Philadelphia, in the *Railroad Gazette* of Jan. 30, 1885. After some discussion, the further consideration of the subject was deferred, as a paper thereupon is anticipated.

The Secretary announced the death of Mr. D. Hudson Shedaker, a member of the Club, and asked that a committee be appointed to prepare a memorial for the Proceedings. The Chair appointed Messrs. James R. McClure, Joseph Johnson and John H. Dye, Chairman, and the meeting adjourned.

##### Western Society of Engineers.

The 203d meeting was held in Chicago, Feb. 17, President Williams in the chair.

The committee appointed to report on the suggestions made by Vice-President Chanute at the last meeting, made the following report:

"1. The Secretary to communicate with the Secretary of the Association in regard to the plan proposed by Vice-President Chanute for joint discussion of papers by the different societies of the Association.

"2. A committee of three to be appointed to prepare a list of engineering subjects upon which the Society would invite papers.

"3. A committee of three to be appointed to report upon a plan for securing an endowment fund, the revenue of which shall be devoted to the award of annual prizes for the best paper contributed by a member."

This report was adopted.

Mr. Morehouse presented amendments to the constitution and by-laws, which were laid on the table.

The Secretary read a letter from Mr. E. B. Noyes, a former member of the Society, requesting signatures to a petition to the President of the United States, asking that a civil engineer be appointed to the position of Chief of the Bureau of Yards and Docks of the Navy Department.

The President having requested Mr. Green to take the chair, read a paper, "The Separate vs. the Combined System of Sewerage as Exemplified in the Drainage of Hyde Park," illustrated by maps and plans.

After discussion of the paper the Secretary presented a

\* This form of plate has been illustrated and described in the *Railroad Gazette*, page 615, Aug. 22, 1884. It is also shown in the *Car-Builders' Dictionary*, figs. 2,107 to 2,109.

† A somewhat similar fire-box was illustrated in the *Railroad Gazette*, page 878, Dec. 12, 1884.



paper by Mr. R. Frank Hartford, "Some New Sewer Formulae." Reading of this was postponed to the next meeting. Adjourned.

#### Rotary Steam Snow-Shovel.

The rotary steam snow-shovel, illustrated in the *Railroad Gazette* of Sept. 12, 1884, has been materially modified since that date, and a powerful sample of the modified machine, which has been building for the past three months at the Cooke Locomotive Works, is about to be shipped this week to Chicago for trial. In the new machine the oblique blades of the rotary knife in front are reversible, as is also the direction of the shoot at the top, so that the stream of snow shot from the fan or rotary "shovel" may be delivered to either side, and the change can be made almost instantly whenever the machine is not actually delivering snow.

The driving engine for the fan and knife in this machine has two 17x22 in. locomotive cylinders attached to an ordinary locomotive boiler, mounted on a heavy wrought-iron frame and extra strong trucks. Behind this is attached a tender, and behind the tender the propelling locomotive. The machinery and boiler of the snow-plow itself is completely housed in, and the car is provided with a flange and ice-cracker independent of the snow-plow proper, which latter is intended to cut a clean drift, 12 or 13 ft. wide, through the deepest snow at one passage, and, by the energy of the revolving fans behind the knife, throw it in a continuous stream 50 or 100 ft. away.

The object of this machine is to remove the snow entirely, and throw it for some distance to leeward; and, to effect this, great power (700 to 900 horse-power) and great strength in the working parts have been provided.

#### Railroads in Guatemala.

It is stated that arrangements have just been made for building the Northern Railroad of Guatemala, which is to run from Port Barrios, on the Atlantic, to the city of Guatemala, 230 miles. The contract was given to the Land & Construction Co. of Guatemala, of which Gen. John B. Gordon is President, and the company assigned it, retaining a share of the profits, to John McKeckney, of Chicago; Daniel Callahan, of Atlanta, and others. The contractors are to build and equip the road for \$11,000,000 in bonds of the Republic of Guatemala. The income of the republic last year was \$9,000,000, and its expenses \$8,500,000. Its debt is \$4,000,000. Work is to be started within 30 days, and the road is to be finished within two years. In addition to the bonds mentioned, the contractors are to receive 300,000 acres in rich mahogany and other fine wood lands. The road will run through land rich in iron, tin, copper, coal, and some gold and silver.

#### Electricity on the New York Elevated Railroads.

We have been informed by the daily press at regularly recurring intervals of the proceedings which have taken place at a series of meetings lately held at the residence of an eminent engineer and patent attorney in this city, and attended by representatives of various inventions for operating railroads by electricity. We have also been informed that it is proposed to "institute a series of experiments" upon the Second Avenue Railroad, in which the several competitors are to be allowed to participate, principally at their own expense, on the condition that their inventions are subsequently to be turned over to a "consolidated company," to be formed for the purpose of monopolizing all the electric railroad patents worth having. We are told that the proportion of stock which the competitors are to receive in this consolidated company in payment for their respective interests is to be determined by a "board of arbitrators," composed, as our esteemed contemporary the *Electrical World* expresses it, of "one very eminent non-resident expert, three absolutely inept officials, and one pre-eminent expert absent foreigner."

If this remarkably ingenious and original scheme is ever carried forward so far as the point where the board of arbitration decides "without appeal" upon the comparative value of the different inventions, the scientific world will witness an electrical row of unprecedented dimensions; but we hardly think it will ever get so far as that. Long before this board of eminent savans get their "picture" completed, we shall probably have electric railroads in successful operation in nearly every country in the world. In fact, we already have the Portrush Railroad in Ireland, which is as long as the Second Avenue line, and which has been in successful operation, carrying on a regular traffic the same as any other railroad, for a year or more, and moreover, as we are informed, earning a 12 per cent. dividend. It is no doubt true that the mechanical and electrical arrangements of the Portrush Railroad would be unsuitable, without material modification, for the elevated railroads of New York city, but the results which have been obtained by it prove conclusively the practicability of the system, and what is more important, the possibility of operating it continuously at a profit.

Apparently the only thing that really needs to be done is to place the elevated railroad problem in the hands of some electrical engineer of experience and ability for solution. There is no lack of this class of talent to be had in this country, although we do not find it represented on the "board of arbitration" above spoken of. In our opinion, the managers of the elevated railroads would find no difficulty in negotiating a contract with the United States Electric Lighting Co., the Edison Electric Light Co., or several other corporations or persons that might be mentioned, who are accustomed to deal with such problems, and would undertake to operate the elevated roads with much greater convenience, economy, and safety than is possible under the present system. We do not, in short, think that anything of importance is likely to be accomplished within a reasonable time in any other way.—*Electrician and Electrical Engineer.*

#### THE SCRAP HEAP.

##### A Runaway Train.

The fastest run ever made on the St. Louis & Cairo Railroad occurred between 3 and 4 o'clock Tuesday evening, Feb. 17, between Alto Pass and the tunnel. It was a special, loaded with ties and rails. The engineer started over the hill at a good rate of speed, when all of a sudden he discovered that his sand was out and the momentum had become too great to be overcome by the engine without it. On all that heavy train there was but one serviceable brake, and it was on the caboose, the lightest car in the train. On it went, gathering momentum at each grade. It soon attained fully a mile a minute, and on it went, over high dumps and lonely trestles, around short curves and high bluffs, across blood-curdling gulches, through deep cuts and lonesome cañons, throwing ties at every curve. She slung a half car-load, more or less, but principally less, at the station house in Mountain Glen. Haven't heard whether its annihilation was effected or not. By this time the ties that remained on had slipped and scowled until the train was about 20 feet wide. This enabled us to hit the bridge south of Mountain Glen a ferocious lick, but didn't knock it into pi, and so the train passed over in safety. It was on the level here that the engineer got control of his engine and took her up in time to save the tunnel. The lurid glow of uncertainty that overhung the fate of that train furnished the conductor an able-

bodied excuse for assuming the character of a tramp *pro tem*. He caught up while the ties were being replaced, and decided that, in view of the slippery condition of the road-bed, he would ride to Jonesboro. No damage, nobody hurt, and everybody glad of it.—*Jonesboro (Ill.) Gazette, Feb. 21.*

#### The Conductor's Awful Fate.

"Pretty cold," said a suburban resident to the conductor on one of the C., H. & D. commuters' trains this morning, and he tore off his trip-slip ticket.

"Rather," answered the man of the punch, with a smile. "Cold enough for you?" said the next passenger, as he tendered his ticket.

"Just about," and the conductor smiled again as he replied.

"Sorter chilly," was the original observation of the third commuter.

"Sorter," echoed the conductor. "Well, how does this cold weather strike you? Freshen you up?" briskly said a little passenger standing in the aisle.

"Yes," and the conductor had a listless expression.

"This is cold, now, isn't it?" remarked the next passenger.

But the ticket-taker only nodded.

"How do you like this? Cold enough, eh?" was the cheery question of a man near the middle of the car.

The conductor was solemnly silent.

"You must suffer awfully awful in this dreadfully dreadful cold weather," sympathetically said a pretty school-mistress, who occupied a seat in company with a tiny lunch basket and a bundle of books.

"Yes, mum," and the conductor made a heroic effort to look pleasant as he replied.

"Cold enough for you?" said the man behind the teacher.

A savage light came in the conductor's eyes.

"Cold enough for you?" remarked the next passenger.

But the conductor neither answered nor took his ticket.

He glared wildly around, then fled and jumped from the train.

The railroad officials will bury him, and the epitaph on his tombstone will simply be:

"Here lies a man who was killed by being asked if it was cold enough for him. We hope that he does not now find it too warm."—*Cincinnati Times-Star.*

#### Misplaced Confidence.

An engineer on a Vermont railroad—so Remus heard recently—had a little surprise party the other day—and this was how it came about: S— is a good driver, and his hobby is to take a special delight in whatever engine he happens to be running, and to think she "is the best engine on the road, sir." He pulled out of St. Albans one day with 11 cars—10 of them freight and one passenger, drawn by the "—." Things went smoothly and he was more than pleased with the way in which his engine did her work. M— was reached, and the engineer was there given 20 minutes to run to M— Junction and meet another train. His engine steamed out of M— in good shape, and S— pulled open the throttle and let her go. He enjoyed it immensely, and said to a brakeman who was on the engine with him: "I tell you, this engine is a good one. She's a daisy, she is. Just see her go. They ought to have this engine to run that fast train with."

"Oh," said the brakeman, "she isn't heavy enough for that."

"Heavy enough!" said the engineer, in a disgusted tone; "heavy enough? why just see how she walks along with these 11 cars—ten of them heavy freight cars, too. I tell you she's a daisy!"

Soon the six miles were run, and S— pulled his engine up to the station in a very satisfied manner; but when he discovered that his train had broken in two, and that the "eleven" cars he had credited that engine with hauling over the rails so easily consisted really of only two cars (the other nine having been left at M—), he was considerably surprised. He went back after the rest of his train, and at last ascertained it was uncertain whether he considered that engine a daisy or not. He looks upon that particular incident as a case of misplaced confidence.—*Remus, in St. Albans (Vt.) Messenger.*

#### Railroad Tobogganing.

"Did you ever see a railroad train running in one direction while the wheels were going the other?" inquired a conductor on the Illinois Central.

"Never."

"Well, down on our Springfield Division, between Gilman and Clinton, we had that experience a few days ago. The fall of soft, sticky snow stuck right on top of the rails, warmed a little in the noon sun, and in the afternoon hardened in the cold. We didn't get a train through till near night that day. The rails were two streaks of glistening ice. Up near Pulaski we struck a big grade put at a station where we were trying to stop. The engineer put on the brakes and finally reversed the lever and pulled the throttle wide open. But it was no go. We went down the grade faster than I ever traveled before, with the driving wheels of our locomotive going backward. It was a three-mile slide. Those who saw us go down say it was the oddest sight they ever saw. I don't want any more railroad tobogganing in mine."—*Chicago Herald.*

#### Running on Two Tracks.

At New London, Conn., recently the rear car of a freight train ran on a side track and the switchman on duty made himself as small as possible and waited for the smash. Somehow the cars held together, the last one ran the whole length of the siding and jumped back on the main track, and the engineer did not know till afterward that his train had been running on two tracks.

#### Water.

"What is a railroad pool, mah?" asked Johnny Jarphly. "I presume it is a place where the railroads water their stock," Johnny, replied his mother, "I've often heard of the cow-catchers."—*Pittsburgh Chronicle-Telegraph.*

"What shall I give the children? I want to make them a handsome present, you know," said a railway magnate. "Why don't you give them some of the stock in your road?" suggested his wife. "What are you thinking of?" cried the r. m. in amazement. "Do you want to drown the children?"—*Boston Transcript.*

"Pa," asked young Johnnie Jarphly, "what is a default?"

"He is a man who loses money that does not belong to him, my son," replied Mr. Jarphly.

"And what is a financier?"

"One who hangs on to it."—*Pittsburgh Chronicle-Telegraph.*

#### A Dangerous Wagon.

A blacksmith in the middle Warren oil fields was called upon by a well shooter a few days since to make some repairs on the running gear of a wagon which he used in carrying nitro-glycerine. He crawled in under the wagon. He found a bolt broken and took a hammer to drive it out to make room for a new one. A deafening explosion followed the first stroke of the hammer. The wagon was shattered to pieces, which were thrown in every direction. He was

knocked senseless to the ground and so badly injured that his life is despaired of. The owner of the wagon stood several feet away, but was thrown to the ground. One wheel of the wagon was carried into a tree 20 ft. distant. The explosion is accounted for on the theory that a quantity of nitro-glycerine had leaked out of a can at some time while being transported from the factory and had collected on the running gear of the wagon. The blow from the hammer was all that was needed to explode it.—*Stowell's Petroleum Reporter.*

#### A Prompt Applicant.

A rugged-looking young man, wearing a cap, a rusty blue pea-jacket, and a blue flannel shirt, ran up the stairs, three steps at a time, leading to the office of a railroad official in Jersey City. Entering the office, he took off his cap, and as soon as he could get his breath, addressed the officer:

"I want to leave my name for the job o' breakin' on freight train 30," said he. "Jimmy Riley's out of it. He jist got cut in two up in the yard. The train was coming in purty fast, and the cars was icy on top. The engineer whistled for brakes, and Jimmy started to run over the top o' the train. He slipped and fell betwixt two cars. He lit on the bumper and grabbed to save himself, but couldn't ketch nothin', and dropped to the rail. Both trucks went over him. Me and another feller was there, and we started for here as fast as we could get to ask for Jimmy's place. I got here first, and I'd like the job first-rate if you kin give it to me, sir."

The railroad official promised to hold the application for consideration, and the man went out evidently well pleased.—*Philadelphia North American.*

#### A Conditional Offer.

"I will give you a conductorship on the road on one condition," said the superintendent.

"What condition is that, sir?" asked the applicant.

"That when you get ready to buy a house and lot you buy of me. I have a little place in the suburbs that I know will suit you."—*New York Sun.*

#### Provisions in Case of Accident.

To-day the Old Colony Railroad management will begin to equip its freight and construction trains and long-distance passenger trains with "emergency boxes." These boxes are light, japanned tin cases, appropriately and plainly lettered, and placed in positions where they will be readily available in case of accidents which may involve injury to either passengers or employees. These boxes contain surgeons' adhesive plaster, isinglass plaster, adhesive bandage, roller bandages, rubber bandages, styptic cotton, ligatures and needles, scissors, safety pins, etc. When the lid of the case is thrown upward, a small pamphlet is the first thing revealed; and this contains full directions for proceeding to stop bleeding, how to apply the bandages and implements found within the case, and what should be done in case of crushed feet, burning or scalding, broken bones, wounds by cutting, bruises, etc. These boxes will be kept at hand on all trains, and upon every part of the Old Colony system where their use may be required.—*Boston Herald, Feb. 24.*

These boxes are now in use on quite a number of roads—and should be in use on all.

#### A New Idea in Excursions.

The "Bee Line," or C., C. & I., through Mr. James De Wolfe, the enterprising passenger agent at Columbus, O., has organized something new in the shape of an "Old Maids' Basket Picnic" to the New Orleans Exhibition. It is to start from Galion, O., March 3, taking in passengers at all the principal stations to Indianapolis, and will reach New Orleans March 5. The object is to secure a sociable party, and, as the old maids are liberal, they have decided to permit a limited number of bachelors of unexceptionable standing to accompany them on the excursion, which will doubtless be a successful one.

#### A Narrow Escape.

A narrow escape from what in all probability would have been a terrible calamity was made near Tamqua, Pa., a few days ago. A wagon, laden with powder and dynamite, was being driven across the railroad tracks, when the driver noticed a train approaching. By an almost superhuman effort he succeeded in safely backing the team out of the way of the train, which was going at the rate of 40 miles an hour.

#### Why.

An anti-railroad orator had the floor in the Florida Legislature the other day. He gave an eloquent recital of the high-handed outrages committed by the railroads, and in conclusion exclaimed, with telling effect: "And why, let me ask this honorable body, do the railroads do this?" At this point a bony legislator three seats in front of him, rose, and drawing from his pocket a handful of railroad passes, said, "This is why." The eloquent orator had no more to say.—*Exchange.*

They think so much of their new railroad out in Greenville, that the Superior Court adjourned the other day to see a freight train come in.—*Macon (Ga.) Telegraph.*

Railroad President (to stockholder)—The road is in a bad way. I fear there is nothing to be done but to pray for a receiver.

Stockholder (with emotion)—Well, while you are about it, you might as well pray for me too.—*New York Times.*

The road-master of a Connecticut railroad inspects the roadbeds and detects any irregularities in the tracks while riding on a velocipede at the rate of 20 miles an hour. Every time he takes a header into the next county he knows there is a defect in the track.—*Boston Globe.*

#### A New Kind of Snow-Plow.

An exchange tells the following story: "Twenty-five men commenced shoveling at six o'clock yesterday, making little if any headway. Gen. Priest ordered nitro-glycerine placed in the bank to blow it out. In the meantime hogs belonging to John Vosburg broke out of their pen and reconnoitered the place. The natural desire of these animals to eat anything sweet is notorious. One devoured, it is estimated, about 20 pounds of the explosive, and wallowed on the track to a point where it got stuck and laid down. About 8:30 this morning a freight engine, which was trying to push through the eastern end of the snow bank, struck the glycerined hog, and the explosion was so terrific when the snow-plow struck the loaded hog that an avenue was torn through the snow bank, and an easy path was made for the freight train."

#### General Railroad News.

##### MEETINGS AND ANNOUNCEMENTS.

###### Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

*Chicago, St. Louis & Pittsburgh*, annual meeting, in Indianapolis, March 18.

*Cleveland, Columbus, Cincinnati & Indianapolis*, annual meeting, at the office in Cleveland, O., at 10:30 a. m., on March 4.

*Grand Rapids & Indiana*, annual meeting, at the office in Grand Rapids, Mich., March 4.

*Illinois Central*, annual meeting, at the office in Chicago, March 11.



**Louisville, New Albany & Chicago.**—Annual meeting at the office in New York, March 11, at noon.  
**Missouri Pacific.**—Annual meeting, at the office in St. Louis, at 9 a. m. on March 10.  
**Pennsylvania Railroad.**—Annual meeting, in Musical Fund Hall, in Philadelphia, at 11 a. m. on March 10.  
**Texas & Pacific.**—Annual meeting, at the office, No. 195 Broadway, New York, March 3, at noon.  
**Union Pacific.**—Annual meeting, at the office, in Boston, March 25.  
**Wabash, St. Louis & Pacific.**—Annual meeting, at the office in St. Louis, at 9 a. m. on March 10.  
**West Jersey.**—Annual meeting, at the office in Camden, N. J., March 3, at noon.

#### Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:  
**The National Association of General Passenger & Ticket Agents** will hold its next meeting in New Orleans, on Tuesday, March 17.  
**The Southern Time Convention** will hold its spring meeting in New Orleans, Wednesday, March 25.  
**The General Time Convention** will meet at the Lindell Hotel, in St. Louis, on Wednesday, April 8.  
**The Association of American Railroad Superintendents** will hold its half-yearly meeting in Richmond, Va., on Wednesday, April 15.  
**The American Association of Train Dispatchers** will hold its annual convention in Denver, Col., on Wednesday, June 3.  
**The Master Car-Builders' Association** will hold its annual convention at the Hygeia Hotel, Old Point Comfort (Fortress Monroe), Va., beginning on Tuesday, June 9.  
**The Master Mechanics' Association** will hold its annual convention in Washington, beginning on Tuesday, June 16.  
**The Car Accountants' Association** will hold its annual convention at Minneapolis, Minn., beginning on Tuesday, June 23.  
**The Master Car-Builders' Club** will hold regular meetings at its rooms, No. 113 Liberty street, New York, on the evening of the third Thursday in each month.  
**The New England Railroad Club** will hold its regular meetings at its rooms in the Boston & Albany station, in Boston, on the evening of the fourth Wednesday in each month.  
**The Western Railway Club** will hold regular meetings at its rooms, No. 102 Adams street, Chicago, on the third Wednesday in each month.

#### Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:  
**Chicago, Burlington & Quincy.** 2 per cent., quarterly, payable March 15 to stockholders of record Feb. 21.  
**Delaware & Hudson Canal Co.** 1½ per cent., quarterly, payable March 10. Transfer books close Feb. 26.  
**Iowa Falls & Sioux City** (leased to Illinois Central), 1½ per cent., quarterly, payable March 2 to stockholders of record on Feb. 14.

#### Foreclosure Sales.

The **Cleveland, Delphos & St. Louis** road was sold in Toledo, O., Feb. 19, under a decree of foreclosure, and was bought for \$15,000 by Messrs. William Semple, Joseph Boemer and James Callery, a committee representing the bondholders, who are chiefly residents of Pittsburgh. The road is a narrow gauge line extending from Delphos, O., east to Mount Blanchard, 46 miles. The bonded debt was \$460,000. Arrangements have already been made to organize a new company to operate and extend the road.  
The **Toledo & Indianapolis** road was sold in Toledo, O., Feb. 25, under foreclosure of mortgage, and bought for \$150,000 by F. G. Jilson, of Woonsocket, R. I., as agent for the bondholders.  
The sale of the **Austin & Northwestern** road has again been postponed, from Feb. 18 to June 3, at Austin, Tex. The Court has lowered the minimum price to \$150,000.

#### National Association of General Passenger & Ticket Agents.

The following notice has been issued by Secretary A. J. Smith: "The annual meeting of this Association will be held in New Orleans, La., at the Hotel Royal, Tuesday, March 17, at 11 a. m. Blank credentials will be furnished new members at the meeting."

#### Southern Association of General Passenger and Ticket Agents.

A called meeting of this association was held in Atlanta, Ga., Feb. 21, all the principal lines being represented. It was resolved that excursion tickets to New Orleans be sold at a rate of 1½ cents per mile from all points within 500 miles from New Orleans, and 1 cent per mile from points over 500 miles distant, the distance to be computed on the shortest line. Tickets are to be limited to 10 days and a special form of ticket is to be provided. Limit of time from Atlantic coast points, however, may be made 15 days. The sale of the present 15 and 40 day excursion tickets is to be continued, and no excursion to be made available later than May 31 next.

#### ELECTIONS AND APPOINTMENTS.

**Addison & Northern Pennsylvania.**—At the annual meeting of the stockholders held in New York, Feb. 24, the following directors were elected: Thomas C. Platt, Geo. R. Blanchard, James E. Jones, Chas. L. Pattison, Royal W. Clinton, Walter S. Gurnee, Jr., Henry P. DeGroot, James Horton, John W. Hammond, Wm. Brookfield, Edmund S. Bowen, Frank H. Platt, Wm. C. Sheldon. At a meeting of the directors the following officers were elected: T. C. Platt, President; William Brookfield, Vice-President; J. E. Jones, Secretary; Wm. C. Sheldon, Treasurer.

**American Institute of Mining Engineers.**—At the annual meeting in New York last week the following officers were elected: President, James C. Bayles, New York; Vice-Presidents, John Fulton, Johnstown, Pa.; Richard Pearce, Denver, Col.; C. A. Stetefeldt, New York; Treasurer, Theodore D. Rand, Philadelphia; Secretary, R. W. Raymond, New York.

**Atchison, Topeka & Santa Fe.**—Mr. J. F. Goddard, Traffic Manager, announces the following changes in the staff of his department: "N. T. Spoor, General Agent at St. Louis, is transferred to Kansas City, the agency of the company at St. Louis having been discontinued. The agency in Utah is also discontinued, and the territory placed in charge of W. B. Hamblin, General Agent at Denver. P. J. Flynn, General Agent, is transferred to Cincinnati, relieving A. E. Lippincott, resigned. N. A. Dane, Passenger Agent, Buffalo, will hereafter have charge of freight business at Buffalo, and such other territory as may be assigned to him, with the title of Freight and Passenger Agent."

**Baltimore & Ohio.**—Mr. John W. Davis is appointed First Assistant to the President; Mr. Andrew Anderson Assistant to the President; Dr. W. T. Barnard, Assistant to the President.

The former office of Superintendent of Construction and

Repairs is abolished. Mr. John Bradshaw is appointed Superintendent of Construction, and will report to the First Vice-President. Mr. W. N. Bolling is appointed Engineer of Real Estate, and will report to the General Manager.

Mr. Andrew J. Bickert is appointed Master Mechanic in charge of the Mount Clare shops, Baltimore, replacing Mr. I. N. Kalbaugh, transferred to the Pittsburgh Division.

**Bennington & Rutland.**—Mr. E. D. Bennett, of Bennington, Vt., has been appointed Superintendent in place of F. C. White, deceased.

**Boston & Albany.**—The new board has re-elected the officers of last year, as follows: William Bliss, President; James A. Rumrill, Vice President; Augustus L. Soule, General Counsel; Charles E. Stevens, Treasurer; Walter H. Barnes, General Superintendent; Arthur Mills, General Traffic Manager; A. S. Hanson, General Passenger Agent; Henry T. Gallup, General Freight Agent; Myron E. Barber, Auditor.

Mr. Charles B. Lentell (late Foreman of the Newton Highlands Branch) has been promoted to be Road-master of the Boston & Worcester Division, in place of L. C. Tolman, deceased.

**Central Missouri.**—The directors of this new company have elected officers as follows: President, George J. Post, New York; Vice-President and Chief Engineer, J. T. K. Hayward, St. Louis; Secretary and Treasurer, L. C. Nelson, St. Louis.

**Chicago & Alton.**—Mr. Robert Somerville has been appointed City Ticket Agent in Chicago in place of A. J. Moore, resigned. Mr. George J. Charlton succeeds Mr. Somerville as Chief Clerk of the passenger department.

**Chicago, Milwaukee & St. Paul.**—Mr. Roswell Miller, for three years past Mr. Merrill's assistant, has been appointed General Manager in place of Mr. S. S. Merrill, deceased. Mr. Joseph F. Tucker succeeds Mr. Miller as Assistant General Manager and will, it is understood, have control of the traffic department. Mr. Tucker is well known from his long service with the Illinois Central road, having been with that company for 28 years, serving as General Freight Agent, General Superintendent and Traffic Manager. He left the Illinois Central about a year ago, and his time since then has been chiefly occupied as arbitrator for several of the Western traffic associations.

**Chicago & Northwestern.**—Mr. W. S. Mellen, General Freight Agent, has been promoted to the position of Assistant General Superintendent. Mr. H. R. McCullough, First Assistant General Freight Agent, will succeed him, and C. H. Knapp, Second Assistant Freight Agent, will succeed Mr. McCullough.

**Cincinnati & Eastern.**—Mr. John R. McLean, of Cincinnati, has been appointed Receiver in place of Samuel Woodward, resigned.

**Cincinnati, Van Wert & Michigan.**—Mr. W. S. Matthias has been appointed General Freight Agent, with office at Van Wert, O. He was recently Traveling Agent of the Cincinnati, Hamilton & Dayton.

**Cleveland & Marietta.**—The following appointments have been made by Receiver Phineas Pease: J. C. Webb, Auditor and Assistant General Ticket and Passenger Agent; J. E. Terry, Assistant General Freight Agent; Jas. C. Taylor, Receiver's Cashier and Car Accountant; William Quinn, Trainmaster; L. C. Bartley, Chief Operator; Alex. Galloway, Master Mechanic; J. I. Kidd, Road-master; R. F. Huddleston, Superintendent of Bridges. The office of the Assistant General Freight Agent will be at Marietta, O. All other officers will have their headquarters at Cambridge, Ohio.

**Consolidation Coal Co.**—At the annual meeting in Baltimore, Feb. 18, the following were elected: President, Charles F. Mayer; directors, Wm. F. Burns, Edward DeRose, Wm. Donnell, John Gregg, Robert Garrett, Decatur, H. Miller, James Sloan, George B. Warren, Wm. Whitegirt. The company owns the Cumberland & Pennsylvania road.

**Cresson, Clearfield & New York.**—At the annual meeting of the stockholders recently held in Hollidaysburg, Pa., the following directors were elected: A. S. Morrow, John Dean, James P. Stewart, William P. Smith, Fred. Jaekel, P. W. Snyder, F. A. Shoemaker, John C. Gates and Martin Bell, Jr. The Board organized by electing A. S. Morrow President; Martin Bell, Jr., Secretary.

**Delaware, Lackawanna & Western.**—At the annual meeting in New York, Feb. 24, the following directors were chosen: Andrew T. McClintock, Wilkes-Barre, Pa.; John I. Blair, Blairstown, N. J.; Gardner R. Colby, Orange, N. J.; Wm. Walter Phelps, Teaneck, N. J.; Benjamin G. Clark, Jersey City, N. J.; W. H. Appleton, Edgar S. Auchincloss, George Bliss, Sidney Dillon, Jay Gould, Elias S. Higgins, Wilson G. Hunt, Percy R. Pyne, Russell Sage, Samuel Sloan, New York. The only new director is Mr. Appleton, who succeeds A. R. Van Nest. The board re-elected Samuel Sloan President; Frederick F. Chambers, Secretary; Frederick H. Gibbens, Treasurer.

**East St. Louis & Carondelet.**—At the annual meeting in East St. Louis, Ill., Feb. 19, the following directors were chosen: Thomas D. Messler, J. N. McCullough, Wm. R. McKeen, John W. Conlogue, John B. Bowman, Charles H. Seybt, J. S. Peers, Edgar Reynolds, C. S. Freeman, Williamson Plant. The new board elected the following officers: President, Thomas D. Messler; Secretary and Attorney, J. B. Bowman; Treasurer, John E. Davidson; General Superintendent, Joseph Hill; Cashier, Geo. K. Thomas.

**East Tennessee, Virginia & Georgia.**—The following notice from Receiver Pink is dated Knoxville, Tenn., Feb. 19:

"C. H. Hudson is hereby appointed General Manager of the East Tennessee, Virginia & Georgia Railroad, and of the Memphis & Charleston Railroad (leased line), to take effect this date. His office will be at Knoxville, Tenn. Major John F. O'Brien is hereby appointed Assistant General Manager. The office of General Superintendent is abolished."

Mr. Hudson was recently Superintendent of Transportation of the Chesapeake & Ohio road, was formerly on the Baltimore & Ohio. Mr. O'Brien has served on the East Tennessee road for a number of years as Chief Engineer and afterward General Superintendent.

Mr. Wm. Hawn has been appointed Auditor for the Receiver in place of Mr. T. D. Flipper, who is transferred to the Memphis & Charleston as Auditor in place of Thomas M. Baker, resigned.

**Houston & Texas Central.**—The United States Circuit Court has appointed Messrs. Benjamin G. Clark and Charles Dillingham Receivers of this road.

**Humeston & Shenandoah.**—Mr. Erskine C. Murphy has been appointed Superintendent of this line, with headquarters at Clarinda, Ia., vice Mr. C. H. Warren, deceased.

**Indianapolis & St. Louis.**—This company (which is controlled by the Cleveland, Columbus, Cincinnati & Indianapolis) has elected J. H. Devereux President; Stevenson Burke, Vice-President; George H. Russell, Secretary and Treasurer.

**Kansas City, Topeka & Northwestern.**—The directors of this new company are: Jacob Safford, Topeka, Kan.; A. C. Merritt, Louisville, Kan.; J. C. S. Murphy, Irving, Kan.; Jason Youran, Blue Rapids, Kan.; A. Richards, Westmoreland, Kan.; W. W. Smith, Waterville, Kan.; Wm. Kalhalfer, Hanover, Kansas.

**Kingston & Pembroke.**—At the annual meeting recently the following directors were chosen: B. W. Folger, C. F. Gildersleeve, S. A. Kirkpatrick, W. Nickle, J. Swift, Kingston, Ont.; J. Munson, Watertown, N. Y.; H. H. Porter, Chicago; J. D. Flower, R. P. Flower, New York.

**Lehigh Coal & Navigation Co.**—At the annual meeting in Philadelphia, Feb. 24, the following were elected: President, Joseph S. Harris; Vice-President, Francis C. Yarnall; Managers, Edward W. Clark, Francis R. Cope, Fisher Hazard, Charles Parrish, George Whitney, James M. Wilcox, Edward Lewis, T. Charlton Henry, Samuel Dickson and Edward B. Leisenring.

**Louisville & Nashville.**—Mr. Harvey Middleton has been appointed Superintendent of Machinery, with office in Louisville, Ky., in place of Mr. Reuben Wells, now General Manager of the road. The appointment takes effect March 1. Mr. Middleton has been for some time Master Mechanic of the St. Paul, Minneapolis & Manitoba road.

**Louisville, New Albany & Chicago.**—Mr. William Dowd, of New York, has been chosen President of this company in place of James Roosevelt, resigned.

**Mississippi & Tennessee.**—Mr. H. G. Coltart has been appointed Car Accountant of this road.

**New York, West Shore & Buffalo.**—The following circular from Freight Traffic Manager C. G. Eddy is dated New York, Feb. 20:

"Mr. F. L. Pomeroy is appointed General Freight Agent of this railway, vice Mr. B. H. Bail, resigned. To take effect March 1. Office at No. 24 State street, New York."

Mr. Pomeroy was recently General Freight Agent of the Southern Central road, and has served on the Boston, Hoosac Tunnel & Western, and other lines.

**Paintersville & Fort Perry.**—Mr. Lyman D. Gilbert, of Harrisburg, Pa., is President of this new company.

**Pennsylvania Railroad Leased Lines.**—At annual meetings in Philadelphia last week officers were chosen as below by the companies named, whose roads are leased to the Pennsylvania Railroad Co.: **Columbia & Port Deposit.**—President, William H. Wilson. Directors, Jacob Tome, G. B. Roberts, Edmund Smith, Wistar Morris, Alexander Biddle, N. P. Shortridge, J. N. Du Barry, W. O. Howard, Henry D. Welsh, John P. Wetherill, John P. Green, W. L. Elkins. **Philadelphia & Trenton.**—Directors, G. M. Dorrance, G. R. Roberts, Wistar Morris, Alexander Biddle, N. P. Shortridge, J. N. Du Barry, John P. Wetherill, A. M. Fox, Edmund Smith, Henry D. Welsh, William H. Wilson, H. H. Houston. **Western Pennsylvania.**—President, J. N. Du Barry. Directors, John P. Green, Wistar Morris, G. B. Roberts, Edmund Smith.

**Pittsburgh, Cleveland & Toledo.**—At the annual meeting in Youngstown, O., Feb. 24, the following officers were chosen: C. H. Andrews, L. E. Cochran, W. J. Hitchcock, Youngstown; W. J. McKinnie, Cleveland; W. C. Andrews, New York; G. J. Foreacre, Newark, O.; H. W. Oliver, W. S. Bissell, James Callery, John W. Chalfant, John McCleaves, Pittsburgh; Thomas M. King, Baltimore. The directors elected C. H. Andrews President; Harry W. Calvin, Secretary and Treasurer.

**St. Joseph, Hanover & Southwestern.**—The directors of this new company are: W. Judson, H. R. Whartwig, St. Joseph, Mo.; J. B. Campbell, W. H. Knight, Clay Centre, Kan.; J. W. Beach, Greenleaf, Kan.; C. S. Chapman, Wm. Kalhalfer, Hanover, Kansas.

**Scioto Valley.**—At the annual meeting in Columbus, O., Feb. 12, the following directors were chosen: Horace Porter, E. F. Winslow, George Watkins, F. H. Davis, Marcus Boggs, George Davis, W. W. Franklin, Joseph Robinson, George Skinner. Mr. Watkins is the only new member of the board. The Board organized by electing F. H. Davis President; W. P. Hillhouse, Secretary.

**Sylvania & Rocky Ford.**—Mr. J. C. Overstreet has been appointed Superintendent of this Georgia road.

**Texas & St. Louis.**—Mr. Richard Williams, late General Foreman of the Brooks Locomotive Works, has been appointed Master Mechanic of the Missouri & Arkansas Division of this road, with headquarters at Pine Bluffs, Arkansas.

**Utah Eastern.**—Mr. M. McMillan has been appointed Receiver of this road by the United States Court at Salt Lake.

**Valley, of Ohio.**—Mr. C. T. Johns has been appointed Master Mechanic, with office in Cleveland, O. He will have charge of the Car Department also.

**Wabash, St. Louis & Pacific.**—Mr. H. G. Miller has been appointed Superintendent of the dining-car service of this road, with headquarters at Decatur, Ill.

A circular from this company gives the following changes: "J. S. Goodrich is appointed Master of Transportation of the Eastern Division, except Cairo and Rantoul lines, with headquarters at Peru. He will represent the Superintendent in all transportation matters, except such duties as properly belong to the Chief Clerk, and will, in addition, act as Trainmaster of Fifth and Sixth districts."

"H. N. Coffinberry, Trainmaster, is relieved from care of the Seventeenth District, and will continue in charge of the Third and Fourth districts, with headquarters at Butler. He will also have charge of train dispatchers and car distribution on his districts."

"J. H. McEvoy is appointed Trainmaster of the Seventeenth District, with headquarters at Logansport, West Side. He will have charge of the car distribution on his district, and will be held responsible for Logansport, West Side, yard, and prompt handling of Fourth District trains while in that yard."

Mr. H. A. Clay is appointed Contracting Agent for this company, with office at No. 290 Washington street, Boston, vice T. W. Seaverns, resigned.

#### PERSONAL.

—Mr. Thomas M. Baker has resigned his position as Auditor of the Memphis & Charleston road.

—Mr. Samuel Woodward has resigned his position as Receiver of the Cincinnati & Eastern road.

—Mr. B. H. Bail has resigned his position as General Freight Agent of the New York, West Shore & Buffalo road.

—Mr. James Roosevelt has resigned his position as President of the Louisville, New Albany & Chicago Co., but continues a director.

—Mr. William H. Harrison has resigned his position as General Passenger and Ticket Agent of the Columbus, Hocking Valley & Toledo road.



—Mr. A. E. Touzalin has tendered his resignation as Vice-President of the Atchison, Topeka & Santa Fe Co., to take effect April 1 next. It is said that Mr. Touzalin retires in order to devote his time to his private interests.

—Cleveland dispatches report that the position of President of the Chicago, Milwaukee & St. Paul Co. was recently offered to Mr. John Newell, but that he has declined the offer, preferring to remain in his present office on the Lake Shore & Michigan Southern.

—Capt. Joseph Milfin died Feb. 18, at his residence, near Shippensburg, Pa. He was a direct descendant of ex-Governor Milfin, of Pennsylvania, and was known throughout the state as a civil engineer, having been engaged on the Pennsylvania and other railroads at various times. His death was from heart disease.

—Mr. Isaac Maynard, who died in Utica, N. Y., Feb. 23, was born in England in 1815, but came to Utica in 1836 and had ever since lived there. For many years he was a member of the firm of Thorn & Maynard, manufacturers of soap and candles. In 1861 he was elected Treasurer of the Utica & Black River Railroad Co., and held that office until his death. He was also for a number of years a director of the Utica, Clinton & Binghamton Co., and for four years past has been President of that company. He was highly esteemed by his friends and business associates. He leaves a large fortune.

—Mr. William C. Kingsley, who died in Brooklyn, N. Y., Feb. 21, aged 52 years, was for many years a civil engineer and a contractor. While still a young man he was in the employ of the contractors on the Pennsylvania state canals, and subsequently took contracts on his own account on the Pennsylvania Railroad and other roads in Illinois, Wisconsin and other Western states. About 1860 he settled in Brooklyn, where, in partnership with Mr. A. C. Keeney, he built the Brooklyn water-works, and had many other city contracts for sewers, pavements and similar works. Mr. Kingsley was one of the first and most active advocates of the building of the Brooklyn Bridge, and was one of the incorporators of the company which commenced its construction. When it was made a city work he was appointed one of the board of trustees, and was President of the board nearly all the time when the bridge was under construction. He retired only a few months ago on account of failing health.

## TRAFFIC AND EARNINGS.

### Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

Month of January:	1885.	1884.	Inc. or Dec.	P. c.
Nash., C. & St. L.	\$184,986	\$186,992	D. \$2,006	1.1
Net earnings...	78,888	74,730	I. 4,158	5.6
Norfolk & West.	230,350	213,020	I. 17,330	8.0
Net earnings...	103,556	83,373	I. 20,183	24.0
Northern Cent.	404,216	469,846	D. 65,630	1.4
Net earnings...	167,732	136,732	I. 30,940	22.7
Pennsylvania	3,277,322	3,574,323	D. 296,711	8.4
Net earnings...	985,574	1,161,138	D. 175,562	15.1
Utah Central	85,060	75,383	I. 9,676	13.0
Second week in February:				
Canadian Pacific	\$92,000	\$50,000	I. \$42,000	84.0
Chi. & East. Ill.	16,389	22,977	D. 6,588	28.6
Chi., Mil. & St. P.	273,000	306,740	D. 33,740	11.0
Chi. & Norwest.	228,600	325,330	D. 96,730	29.7
Chi., St. P. & M. & O.	71,100	72,700	D. 1,600	2.2
Chi., Ind. & St. L.	44,985	50,671	I. 14,324	46.7
Ill. Central	203,000	208,065	D. 5,065	2.4
Iowa lines	21,460	33,910	D. 12,510	36.8
Long Island	32,736	35,534	D. 2,798	7.8
Louisv. & Nashv.	257,415	222,995	I. 34,420	15.4
Mil. L. S. & W.	14,965	18,560	D. 3,595	19.2
Norfolk & West.	55,800	54,482	I. 1,318	1.5
Peoria, Dec. & E.	11,598	12,246	D. 648	5.3
Roch. & Pitts.	14,416	17,504	D. 3,088	17.6
St. L. & San F.	60,220	66,141	D. 5,921	8.9
Third week in February:				
Canadian Pac.	\$100,000	\$54,000	I. \$46,000	85.2
Chi., Mil. & St. P.	298,000	307,913	D. 9,913	3.3
Denver & R. G.	86,709	94,797	D. 8,088	6.4
Roch. & Pitts.	14,803	17,504	D. 2,701	15.4
St. L. & San Fran.	73,400	76,500	D. 3,100	4.1
Year ending Dec. 31:				
Mem. & Charles.	\$1,439,071	\$1,999,424	I. \$560,353	10.8

Weekly earnings are usually estimated in part, and are subject to correction by later statements.

### Coal.

Coal tonnages for the week ending Feb. 14 are reported as follows:

	1885.	1884.	Inc. or Dec.	P. c.
Anthracite	430,988	450,815	D. 19,827	4.4
Eastern bituminous	143,595	143,311	I. 284	.2
Coke	48,143	65,614	D. 17,471	26.6

A dispatch from Philadelphia says: "The coke pool, which has been the subject of several official conferences, has been signed by all the parties in interest, Vice-President Thomson on behalf of the Pennsylvania Railroad Co., Vice-President McCullough for the Pennsylvania Co. and President Newell for the Pittsburgh & Lake Erie and the Lake Shore. The percentages were practically the same as those already in force. The deliberations reached a conclusion at a meeting held in Pittsburgh on Wednesday last. The pool covers the following distributing points: Bessemer, Pittsburgh, Wheeling, Cleveland and Chicago. The details of the bituminous coal pool have all been agreed upon, and the new rates, which will be much lower than those adopted last Spring, will go into effect on March 1."

Pennsylvania Railroad tonnage for the week ending Feb. 14 was:

	Coal.	Coke.	Total.	1884
Line of road	123,257	44,084	167,341	185,357
From other lines	63,011	4,059	67,070	55,757
Total	186,268	48,143	234,411	241,114
Year to Feb. 14	1,163,141	272,854	1,435,995	1,588,241

Total decrease for the week, 6,703 tons, or 2.8 per cent. for the year, 152,246 tons, or 9.6 per cent.

Cumberland shipments for the week ending Feb. 21 were 20,099 tons; total shipments to Feb. 21 this year, 246,405 tons; last year, 233,990 tons; increase, 13,315 tons, or 5.6 per cent.

The division of tonnage among the anthracite companies in January compares with last year and with the allotment made by agreement for this year as follows, in percentages:

	Allotted.	1885.	1884.
Philadelphia & Reading	38.85	36.6	35.9
Lehigh Valley	19.60	20.8	20.7
Delaware, Lackawanna & Western	16.05	14.5	16.1
Delaware & Hudson Canal Co.	11.00	10.1	10.5
Pennsylvania Railroad Co.	8.40	12.7	11.2
Pennsylvania Coal Co.	5.00	3.9	4.7
New York, Lake Erie & Western	1.50	1.4	0.9
Total	100.00	100.0	100.0

The Pennsylvania Railroad Co., it will be remembered, is not a party to the agreement.

The coal tonnage of the Northern Central Railroad for the year ending Dec. 31 was:

	1884.	1883.	Inc. or Dec.	P. c.
Anthracite	2,723,177	2,402,664	I. 320,513	13.3
Bituminous	1,133,516	1,123,369	D. 10,147	0.9
Total	3,756,693	3,526,033	I. 230,660	6.5

Of the anthracite last year 697,781 tons were carried to Baltimore, the balance delivered to points on the line or shipped North and West.

The coal tonnage of the Chicago & Alton Railroad in 1884 was 1,278,320 tons, against 1,416,350 in 1883; 1,366,641 in 1882, and 1,190,241 tons in 1881. The decrease last year from 1883 was 138,030 tons, or 9.7 per cent.

The coal tonnage of the Chesapeake & Ohio Railroad for January was:

	1885.	1884.	Increase.	P. c.
Coal	100,911	73,838	27,073	36.6
Coke	12,869	5,702	7,167	125.7
Total	113,780	79,540	34,240	43.0

The total coal production of the Colorado mines for 1884 is reported at 1,078,033 tons. The more important districts, with their production, were: Trinidad, 411,442; Boulder, 187,318; Canon City, 167,995; Gunnison, 96,289 tons.

### Cotton.

Cotton movement for the week ending Feb. 20 is reported as follows, in bales:

	1885.	1884.	Inc. or Dec.	P. c.
Interior markets:				
Receipts	24,109	24,305	D. 196	0.6
Shipments	45,981	37,924	I. 8,059	21.2
Stock, Feb. 20	234,231	254,450	D. 20,219	7.9
Exports:				
Receipts	54,324	65,013	D. 10,689	16.4
Shipments	63,041	101,316	D. 41,275	40.9
Stock, Feb. 20	830,055	859,713	D. 129,658	13.5

The total shipments from plantations for the cotton year (from Sept. 1) to Feb. 20 are estimated at 5,143,216 bales; the increase, as compared with last year, is 79,520 bales, the decrease from 1882-83 is 560,436 bales, and the increase over 1881-82 is 357,425 bales.

### Petroleum.

The production of the Pennsylvania and New York oil fields for January is given by *Stowell's Petroleum Reporter* as follows, in barrels of 42 gallons:

	1885.	1884.	Inc. or Dec.	P. c.
Production	1,652,176	1,825,838	D. 173,662	9.5
Shipments	1,804,028	1,686,981	I. 117,047	6.9
Stock, Jan. 31	37,214,274	35,884,509	I. 1,329,765	3.7
Producing wells	21,950	20,756	I. 1,194	5.8

Of the total production the Allegheny District in New York furnished 13.2 per cent.; the Bradford District in Pennsylvania, 43.6; the Warren District, 11.1, and the Lower District, 32.1 per cent.

As for several months past, the shipments exceeded the production for the month by a considerable amount.

The stock reported at the close of the month shows a decrease of 151,852 barrels, this being the excess of shipments over production.

There were 64 new wells completed during January and 10 dry holes, or failures to find oil, are reported. At the close of the month there were 97 wells in process of drilling and 54 new rigs in preparation for drilling. The new wells reported were all of moderate size, no extraordinary strikes having been made.

Shipments for the month were as follows:

	Crude.	Refined.	Total.	P. c. of total.
New York	528,903	14,586	571,489	17.7
Philadelphia	288,525	21,723	310,248	17.2
Baltimore	128,026	2,272	130,298	7.2
Boston	20,733	101,567	122,300	6.8
Cleveland	250,354	—	250,354	13.9
Pittsburgh	122,010	—	122,010	6.8
Local points	215,430	84,895	297,325	16.4
Refined at Creek refineries	225,043	—	225,043	10.0
Total	1,804,028	225,043	1,804,028	100.0

In this table the refined oil is that refined at Creek refineries and from them shipped to the places named. It is reduced to its equivalent in crude, so that the totals represent the amount of crude oil shipped to each place, whether in crude or refined form. The refined oil formed 12.5 per cent. of the total shipments.

### Southern Railway & Steamship Association.

General Commissioner Virgil Powers has issued the following notice, under date of Feb. 13: "At the meeting of the Executive Committee held yesterday at Chattanooga, Tenn., it was ordered that rates from all western points, in effect prior to and on Nov. 1, 1884, to all points south, be restored and put into effect Wednesday, Feb. 18, 1885 (taking effect at shipping points that date), except that rates from Memphis be 3 cents per 100 pounds less than the rates from Louisville, Cincinnati, and other Ohio River points, instead of 5 cents, as was the case Nov. 1, 1884."

### Passenger Notes.

The Mobile & Ohio and the Illinois Central have followed the example of the Louisville and Nashville, and give stop-overs for 10 days to passengers holding excursion tickets to New Orleans. The stop-over is allowed only on the coupon going to New Orleans.

### Passenger Rates.

There is very little change in the matter of passenger rates. The Grand Trunk, which has always insisted on a differential on Boston business, has reduced its rate from Chicago to Boston to \$10.25, to correspond with the reductions made by the other lines, but no other changes are reported.

### RAILROAD LAW.

#### Injury to Employee—Negligence.

In the case of Crowley against the Burlington, Cedar Rapids & Northern Co., the Iowa Supreme Court recently held as follows:

1. Where a railroad car is propelled on a track at an immoderate rate of speed, and a laborer employed about such track, who is near being run over, jumps to get out of the way, and inadvertently steps upon ice, and slips, and is run over, it cannot be said, as matter of law, that the improper speed at which the car was propelled was not the proximate cause of the accident.

2. The rule which requires a traveler about to cross a railway track to look in both directions for approaching trains is not applicable, in its strictness, to an employee at work on the track, because such an obligation would be inconsistent with proper attention to his work.

3. Instruction that the city ordinance regulating the rate of speed at which cars should be run was applicable to the place where the injury in this case was inflicted, held proper.

#### Free Passes—Lessee's Liability for Contract.

In March, 1870, the Erie & Pittsburgh Railroad Co. leased its road to the Pennsylvania Railroad Co., and it in turn

leased to the Pennsylvania Co. By the terms of the lease the lessees assumed all the contracts and covenants of the lessor. Recently a question has arisen as to whether a certain verbal agreement to issue free passes was a contract under the lease. These agreements were made by the Erie & Pittsburgh Co. in 1858, in consideration of the release of the right of way by certain landowners. The Pennsylvania Co., however, when it came into possession of the road, declined to issue these passes. The aggrieved landowners brought suit against the Erie & Pittsburgh Co. for damages for the breach of the verbal agreement. They recovered judgment for \$4,085. The Erie & Pittsburgh Co. then sued the Pennsylvania Co., obtaining judgment for the full amount in the Court of Common Pleas of Erie County.

On writ of error, the Supreme Court reverses the judgment of the Erie County tribunal, Justice Clark filing the opinion. He holds that the liability to issue these passes arose out of an agreement by the lessor company, which was entirely distinct from the obligations assumed under the lease, and that, therefore, the Pennsylvania Co. was not bound by it. The bill will have to be paid, therefore, by the Erie & Pittsburgh Co.—*Philadelphia Press*, Feb. 25.

## OLD AND NEW ROADS.

**Anniston & Chattanooga.**—This company filed articles of incorporation in Alabama to build a railroad from Anniston to a point on the Georgia line, near Alpine, in Cherokee County. The incorporators are L. W. Grant, of Jacksonville, Ala.; A. W. Johnston, Robert Lawrence, Samuel Nobles, William Nobles, R. A. Russell, G. P. Smith, and Isaac S. Smith, of Anniston.

**Baltimore & Ohio.**—Work has been begun on a tunnel at Thomas Station, Pa., on the Wheeling, Pittsburgh & Baltimore Division. This tunnel will be 1,000 ft. long, and when completed will shorten the road considerably, avoiding a number of curves, and will reduce the grade from 129 to 66 ft. to the mile.

**Boston, Hoosac Tunnel & Western.**—This company's statement for the quarter ending Dec. 31 is as follows:

	1884.	1883.	Inc. or Dec.	P. c.
Earnings	\$132,420	\$101,693	I. \$30,727	30.1
Expenses	142,532	91,960	I. 50,572	54.9
Net or deficit	\$10,112	N. \$9,697	D. \$415	4.3
Charges	1,940	3,000	I. 1,060	54.4
Surplus or deficit	\$30,512	\$8,697	D. \$21,815	71.4

The working expenses for the quarter this year were 107.6 per cent., against 90.5 per cent. last year.

**Buffalo, New York & Philadelphia.**—This company's report for the quarter ending Dec. 31 is as follows:

	1884.	1883.	Inc. or Dec.	P. c.
Earnings	\$609,909	\$678,421	D. \$68,512	10.1
Expenses	437,566	389,248	I. 48,318	12.4
Net earnings	\$172,343	\$289,173	D. \$116,830	40.4
Other income	—	3,429	D. 3,429	—
Total	\$172,343	\$292,602	D. \$120,259	41.0
Interest, taxes, etc.	284,462	549,510	D. 265,048	48.3
Deficit	\$112,099	\$256,908	D. \$144,809	56.3

Working expenses for the last quarter were 71.7 per cent. of gross earnings. The large reduction in charges in 1884 is explained by the fact that in the quarter in 1884 only half interest is charged, the other half being funded under agreement with the bondholders.

**California Southern.**—Messrs. Kidder, Peabody & Co., of Boston, contradict the statement that they have agreed to advance the money for the extension of this road in advance of the sale of the bonds.

**Canada, La Crosse & Southwestern.**—This company and the La Crosse, Iowa & Southwestern have been consolidated under the name of the former. Neither company owns any completed railroad. The projected line is to run from the Sault Ste. Marie to La Crosse, Wis., and thence to Kansas City.

**Central of New Jersey.**—A conference was held in New York, Feb. 25, between officers of this company and the Philadelphia & Reading. The relations of the companies were discussed, and it is said that the Central representatives insisted that arrears of rental should be paid up before any new proposition could be considered.

**Central Vermont.**—The following communication from Auditor E. G. Lucas to President J. Gregory Smith is published:

"I beg to inclose you herewith detailed statement of results of the business of the Central Vermont Railroad Co. and roads operated by it, for the six months ending Dec. 31, 1884, which, summarized, shows as follows:

Total earnings	\$1,407,587
Operating expenses (63 per cent.)	882,940
Net earnings	\$519,647
Less rents and state taxes	203,855
Net	\$315,792

"As compared with the six months ending Dec. 31, 1883, please observe that the decrease in earnings was 6.36 per cent., but the decrease in expenses was 13.3 per cent., and the earnings and expenses of the New London Northern Railroad are not included in the foregoing; but it is a pleasure to advise you that the results of their business for the year ending Sept. 30, 1884, show, after paying operating expenses, rents and interest, a profit of some \$40,000. The total issue of bonds, as provided for in the plan of consolidation, was \$7,000,000, \$1,000,000 of which is on deposit with the American Loan & Trust Co., of Boston, to remain as collateral for the floating debt, but not at present subject to any payment of interest; so that your annual interest upon the bonds may be said to be only \$300,000."

**Chicago, Burlington & Quincy.**—It is reported that this company is having a survey made for a line leaving its St. Louis Division, at Brighton, Ill., and running by way of Delhi and Jerseyville to Louisiana, Mo. The object of this line, should it be built, would be to make a shorter connection from St. Louis to St. Joseph by way of Hannibal & St. Joseph road.

**Cincinnati & Eastern.**—A change of receivers puts Mr. John R. McLean, of Cincinnati, in charge of this road. Its affairs are now in very bad condition, and it will require active and energetic management to put them in good shape.

**Cincinnati, Hamilton & Dayton.**—Plans have been adopted for a handsome passenger station in Dayton, O., which will be built by this company, and which will be used also by the Cleveland, Columbus, Cincinnati & Indianapolis and by the Pittsburgh, Cincinnati & St. Louis.

**Delaware, Lackawanna & Western.**—Notice is given that Lackawanna & Bloomsburg first-mortgage extension bonds, due March 1, will be paid at maturity, and interest will cease from that date.



**Dubuque & Sioux City.**—The *Commercial and Financial Chronicle* says: "The lease of this road to the Illinois Central will expire in 1887. The rental price now is 36 per cent. of earnings. The Central considers this rental too high, and recently offered instead to guarantee 4 per cent. on Dubuque & Sioux City stock, on which it would pay the taxes. It is not known whether this offer remains open, but it is presumed that it does."

**East River Tunnel.**—This company has been incorporated to build a tunnel under the East River and Blackwell's Island from Long Island City to a point in New York City. The object is to connect the Long Island and the New York Central roads. Among the incorporators are Messrs. L. Bradford Prince, Robert Townsend, James H. Platt, David B. Sickles, Edward Holland, and Wm. A. Lawrence, nearly all Long Island men.

**Grand Rapids & Indiana.**—The following circular has been issued by the General Freight Agent:

"Transfer steamer between Mackinaw City and St. Ignace having been withdrawn on account of ice, you are hereby notified that transfer tariff No. 5, dated Dec. 10, 1884, will only apply on freight for Marquette and points beyond. All freight for St. Ignace and local points on Detroit, Mackinaw & Marquette road, east of Marquette, must be taken subject to transfer charge across Straits of 10 cents per 100 lbs., minimum charge 25 cents. Until further notice transfer will be made by teams, and no freight should be received unless it can be readily handled and loaded in sleighs."

**Hannibal & St. Joseph.**—The 8 per cent. bonds of this company, dated March 1, 1870, are due March 1, 1885, and they will be paid at maturity at the office of the Chicago, Burlington & Quincy Railroad Co., No. 49 Sears Building, Boston.

**Houston & Texas Central.**—The Southern Development Co. has begun a suit against this company as a creditor, and on Feb. 24 the United States Circuit Court in Houston, Tex., granted an order for the appointment of receivers, pending further proceedings. The Court selected Benjamin G. Clark and Charles Dillingham as joint receivers, and they at once qualified and took formal possession of the road.

**Illinois Central.**—The severity of the snow storm of last week on this road is illustrated by a dispatch from Kankakee, Ill., which says: "The first passenger train from Bloomington over the Illinois Central that has reached Kankakee since the snow blockade arrived to-day. The train left Bloomington last Monday and was stuck all along the line. It has been 168 hours running 68 miles."

**Kansas City, Topeka & Northwestern.**—This company has been organized to build a railroad from Topeka, Kan., northwest to the Nebraska line in Washington County, about 100 miles.

**Lehigh Coal & Navigation Co.**—This company has completed a branch road from its Nesquehoning Valley road, near Tamanend, Pa., to a junction with the East Mahanoy Branch of the Reading road. This new branch is 3½ miles long, and will enable shipments of coal from the Mahanoy region to be made to New York by a direct line. It will be operated by the Reading Co. under its lease of this company's railroad lines.

**Louisville, Evansville & St. Louis.**—In the foreclosure suit against this company there was a hearing before Judge Gresham in the United States Circuit Court at Chicago, Feb. 19, on the application of the bondholders' committee, represented by Mr. Henry D. Hyde, of Boston, for an order authorizing the Receiver to pay the interest, amounting to \$27,000, on the \$900,000 mortgage on the Evansville Branch of the road; to collect and pay the traffic balances with other roads; to issue \$100,000 of receiver's certificates bearing 7 per cent. interest with which to take up \$30,000 of 60 day notes issued for the purpose of paying the pay-roll and the remaining \$70,000 in the purchase of six new locomotives, some rails and shop tools. The Receiver, Mr. George F. Evans, also wished to be allowed compensation for his services at the rate of \$2,500 a year. It appeared that the road was mortgaged for \$4,000,000, the interest on which was \$294,000 a year. The gross earnings were \$60,000 a month and the net earnings \$80,000 or \$90,000 a year. There were some \$700,000 of car-trust obligations, which were being reduced monthly, but the amount now due, including interest, was more than the original debt. It needed some locomotives very badly, and as they could be bought for only \$6,000 apiece, the petitioners thought it was better to buy than rent. The Judge said a court ought to be very cautious before it undertook to put on the property a debt which would cut under the mortgages. It was not contemplated that the road should be continued in the hands of a receiver any great length of time. The requests which were made looked too much like holding the property too long in court, and he did not believe in that. He would therefore decline for the present to issue receivers' certificates for \$100,000, preferring to hold that under advisement, but an order was made giving the Receiver permission to pay the \$27,000 interest, the traffic balances, and the Receiver's salary.

**Marshall & Northwestern.**—This project has been revised and an effort will be made to complete the road from Marshall, Tex., to the Texas & St. Louis, at Pittsburgh, a distance of 50 miles. The line was surveyed some years ago, and some 10 miles of it were graded when work was suspended.

**Mexican Central.**—The earnings of this road for the quarter ending Dec. 31 were:

	Earnings	Expenses	Net	P. c. of exp.
October.....	\$305,073	\$194,363	\$111,010	63.6
November.....	285,128	161,634	124,095	56.5
December.....	327,265	161,923	165,342	49.4
Total.....	\$917,466	\$517,920	\$400,447	56.3

The subsidy collections, with December estimated, amounted in 1884 to \$1,000,000, against \$1,155,792 in 1883.

**Mexican Railroad Notes.**—The Atchison, Topeka & Santa Fe Co. have made a contract with the government to establish a regular steamship line between Mazatlan and San Francisco. This line will be run in connection with the company's steamers plying between Guaymas and the other Gulf ports and Mazatlan.

Says a private letter from Tepic quoted by one of our contemporaries: "We have lost all hope of having any railroad to San Blas. The contractors are making preparations to leave the country. The vessels loaded with rails have landed there at Topolobampo, so that we will have to go on as before, with our trucks drawn by oxen."

The following notes are from the *Mexican Financier* of Feb. 14:

Mr. Luis Terraya, owner of a tract of land through which the Chihuahua & Hidalgo Railroad is to pass, has addressed a letter to the board of directors, stating that in order to facilitate the construction of the said road he is willing to grant to the company all the necessary land for the branch line from Jimenez to Hidalgo, and for a station on his Hacienda San Felipe.

A great deal of complaint comes back from travellers who

have left the country, of the custom house inspection at Paso del Norte of baggage outward bound. As no inspection is made by custom house officials of baggage leaving the United States it is not easy to find any good reason for examining baggage leaving Mexico. Silverware is the only dutiable commodity that could be smuggled out in this way; and no considerable quantity of silver could be taken through without being detected by its weight. As the practice has no rational foundation, the comfort of travelers might as well be secured by its abandonment.

**Milwaukee, Lake Shore & Western.**—Preparations are being made to resume on the extension of this road to Ashland, Wis., as soon as the weather will permit. About 25 miles of track remain to be laid, and of this section about 18 miles are graded and nearly all the bridge work done, so that very little work will remain to be done in the spring. The company intends to build repair shops at Ashland, where all work of the Northern division will be done.

**Nashville, Chattanooga & St. Louis.**—This company's statement for January and the seven months of the fiscal year from July 1 to Jan. 31 is as follows:

	1884.	1883.	Seven months—1884-5.	1883-4.
Earnings.....	\$184,936	\$189,992	\$1,398,487	\$1,413,897
Expenses.....	106,098	112,293	794,960	761,627
Net earn.....	\$82,888	\$74,730	\$603,527	\$652,270
Interest and taxes.....			399,741	386,824
Surplus.....			\$203,786	\$265,446

For the seven months there was a decrease of \$15,410, or 1.1 per cent., in gross earnings; a decrease of \$48,743, or 7.5 per cent., in net earnings; and a decrease of \$61,660, or 23.2 per cent., in surplus.

**New York Central & Hudson River.**—In the Newton suit brought to enjoin the payment of the quarterly dividend last declared, the company interposed a demurrer to the complaint that it did not state facts sufficient to constitute a cause of action. The Court on Feb. 25 gave judgment for the defendant, upon the demurrer with costs. In his memorandum the Judge says that the complaint sufficiently charges that the dividend, the payment of which is sought to be restrained, has not been earned, and that there is not on hand from former earnings any sum or fund from which the dividends, or any part thereof, can be legally paid. Whatever, therefore, the real fact may be, upon its face, the complaint charges the threatened commission of an illegal act. The question then remains whether the plaintiff is in a position to maintain the present action upon it. He shows himself to be the simple unsecured creditor, whose claim has not yet matured, and who has no vested interest in or lien upon the property of the corporation, nor any voice in the management, and he fails to show any present damage. He therefore has no standing in court. The statute does not help him, for that gives an action only after sustenance of damage and the dissolution of the company.

**New York City & Northern.**—The Receiver's statement for the quarter ending Dec. 31 is as follows:

	1884.	1883.	Inc. or Dec.	P. c.
Earnings.....	\$86,298	\$83,703	I. \$2,595	3.1
Expenses.....	80,761	81,437	D. 676	0.8
Net earnings.....	\$5,537	\$2,266	I. \$3,271	144.3
Charges.....	70,627	70,647	D. 20	...
Deficit.....	\$65,090	\$68,381	D. \$3,291	4.8

The charges include interest, rentals and all taxes for the quarter. The interest accrued, but was not paid.

**New York, Susquehanna & Western.**—An approximate statement for the year ending Dec. 31 is as follows:

	1884.	1883.	Inc. or Dec.	P. c.
Earnings.....	\$1,034,308	\$1,038,656	D. \$4,348	0.4
Expenses.....	617,888	638,592	D. 20,704	3.3
Net earnings.....	\$416,520	\$400,064	I. \$16,456	4.1
Interest on bonds.....	403,675	384,760	I. 18,915	4.9
Surplus.....	\$12,845	\$15,304	D. \$2,459	16.1

This company is funding one-half of one coupon only, that due in January, and paying the other half in cash. The coupons are stamped "one-half paid" and deposited with the Park Bank to be held as security for the amount unpaid in case of any embarrassment hereafter, and 6 per cent. scrip payment in 1895, or earlier, at the option of the company, is issued for the half coupon unpaid.

**Norfolk & Western.**—This company makes the following statement of earnings and expenses for January:

	1885.	1884.	Inc. or Dec.	P. c.
Gross earnings.....	\$230,350	\$213,020	I. \$17,330	8
Expenses.....	126,794	129,647	D. 2,853	2
Net earnings.....	\$103,556	\$83,373	I. \$20,183	24
Per cent. of expenses.....	55	61	D. 6	...

The company thus begins the year with a very good showing.

**Northern Central.**—This company makes for January the following comparative statement of gross earnings and expenses:

	1885.	1884.	Inc. or Dec.	P. c.
Gross earnings.....	\$404,216	\$400,846	D. \$3,370	0.8
Operating exps.....	\$224,185	\$244,795	D. \$20,610	8.4
Extraordinary exps.....	12,299	28,259	D. 15,960	57.0
Total exps.....	\$236,484	\$273,054	D. \$36,570	13.4
Net earnings.....	\$167,732	\$126,792	I. \$40,940	22.7

The decrease in gross earnings is small and there was a considerable net gain.

**Northern Pacific.**—The extension of this road to Ashland, Wis., has been inspected and formally accepted by the government commission.

At a meeting held in New York, Feb. 19, the directors ratified the sale of \$2,000,000 general mortgage bonds to a syndicate of bankers. The price received for the bonds is not stated, but it is said to be about par.

At the same meeting the lease of the Oregon Railway & Navigation Co. property was discussed, but no conclusion was reached, although it is said that a majority of the board favored an offer of 5 per cent. on the stock for five years and 6 per cent. thereafter. It is not believed that these terms would be accepted.

**Old Colony.**—The work of connecting two divisions of this road by improving the freight road between North Easton, Mass., and Stoughton, and constructing a short extension to Brockton, is now under way. It is thought this will anticipate and render unnecessary a projected horse railroad.

**Paintersville & Port Perry.**—This company has been incorporated to build a railroad from Port Perry, Pa., to near Pittsburgh, to Starr's Mill in Westmoreland County, a distance of 40 miles. It is intended to be a branch of the South Pennsylvania road, with which it will connect at

Starr's Mill. It will pass through the Westmoreland coke district.

**Pennsylvania.**—This company's statement for January, as compared with January, 1884, shows, for all lines east of Pittsburgh and Erie, a decrease in gross earnings of \$296,711; a decrease in expenses of \$121,149, and a decrease in net earnings of \$175,562. This gives the following figures:

	1885.	1884.	Decrease.	P. c.
Earnings.....	\$3,277,522	\$3,574,233	D. \$296,711	8.4
Expenses.....	2,291,948	2,413,097	D. 121,149	5.0
Net earnings.....	\$985,574	\$1,161,136	D. \$175,562	15.1

All lines west of Pittsburgh and Erie show for the month a deficiency in meeting all liabilities of \$73,420, being a gain of \$37,165 as compared with January of last year.

**Peoria Terminal.**—This company has filed articles of incorporation to build short lines of railroad and connecting branches in Peoria, Ill., and its neighborhood.

**Philadelphia & Reading.**—A joint meeting of the board of managers and the Bartol Committee was held in Philadelphia, Feb. 20. There was a general discussion of the condition of the company's affairs, and finally a joint committee was appointed, consisting of Messrs. John B. Garrett, H. W. Bartol, Joseph Wharton and John Wanamaker, who are to endeavor to form a plan of settlement upon which all parties can agree.

The Joint Committee, since its appointment, has held several meetings, and the Bartol Committee has also held several meetings, and a call has been issued for a general meeting of bondholders on March 2, in Philadelphia, at which reports will be presented for discussion.

In the matter of the report of the Special Master, on the application of the Receivers for permission to pay interest on the floating debt, the United States Circuit Court has approved the report conditionally. The Court says that, taking into consideration the agreement of a large majority of the bondholders, and also considering the benefits to be secured by protecting the pledged securities, it appears best to permit payment of interest in question for the present, allowing a reasonable time to the bondholders to complete the plan of reorganization. The Receivers are therefore authorized to pay interest on the floating debt during the next 60 days; payments after that time to depend on the further directions of the Court.

**Port Jervis & Monticello.**—It is proposed to extend this road from its present terminus at Monticello, N. Y., to South Fallsburg, on the New York, Ontario & Western, a distance of about 6 miles. It is thought that this extension would make the road of some value.

**Portland & Ogdensburg.**—The Receiver reports for the quarter ending Dec. 31, gross earnings, \$80,210; expenses, \$63,612; net earnings, \$16,598. During the quarter various improvements were made and paid for out of the earnings.

**Rochester & Pittsburgh.**—The proposed branch of this road from Rasselas, Pa., into the lumber region adjoining has been abandoned, as the survey showed that the branch would be much too costly for the business proposed to be done over it.

**St. Joseph, Hanover & Southwestern.**—This company has been incorporated to build a railroad from Hanover, Kan., westward to Clay Centre, about 50 miles.

**Securities on the New York Stock Exchange.**—The Governing Committee of the New York Exchange has placed the following securities on the lists:

Gulf, Colorado & Santa Fe, \$536,000 additional second mortgage bonds.

Hannibal & St. Joseph, \$3,000,000 additional consolidated bonds.

St. Louis & San Francisco, \$739,000 additional general mortgage bonds.

Suwanee & Gulf.—This company has been organized to build a railroad from New Brandford, Fla., on the Savannah, Florida & Western road, by way of Trenton and Yuleville to Cedar Key.

**Terre Haute & Southeastern.**—This road has made arrangements under which it will hereafter enter Terre Haute, Ind., on the track of the Evansville & Terre Haute road. The management will also be substantially the same as that road, although there will be no lease or consolidation and a separate organization will be maintained.

**Toledo, Cincinnati & St. Louis.**—The Quigley bondholders' committee gives notice as per order of the court, that bondholders wishing to participate in the benefits accruing from the purchase of the terminal property at East St. Louis can do so by signing the trust agreement of April 9, 1884, on or before the first Monday of March, 1885. Signatures will be received at 8 Beaver street, New York. It is stated for the Corbin Committee that all bondholders can join in the terminal purchase without signing the Quigley agreement.

**Tonawanda Valley & Cuba.**—The employees of this road quit work Feb. 16, for the reason that they then had received no pay for four months. An offer made by the Receiver to pay one month on account was rejected, and no trains have been run over the road since. The road extends from Attica, N. Y., to Cuba, 59 miles; a receiver was appointed last December, on application of the trustee under the mortgages.

**Utah Eastern.**—On petition of some of the stockholders and creditors, a receiver has been appointed for this road. The road is a short line built to reach coal mines in Eastern Utah. It was intended as an opposition line to the Union Pacific for local coal traffic, but the Union Pacific secured control about the time the road was completed and it is not now operated. Most of the rolling stock was taken away and used on the Utah & Northern road.

**Vicksburg & Meridian.**—This company has begun proceedings to condemn property in Vicksburg, Miss., on which it intends to build an incline and wharves for a transfer ferry across the Mississippi. This ferry will complete the connection with the Vicksburg, Shreveport & Pacific road.

**Wabash, St. Louis & Pacific.**—The Receivers will pay on March 3 the semi-annual coupons due Jan. 1 last on \$6,000,000 North Missouri firsts; \$4,500,000 Chicago Division 5s, and those due March 1 on \$937,000 St. Louis, Council Bluffs & Omaha firsts.

**Wind Gap & Delaware.**—The extension of this road to the slate quarries at Bangor, Pa., has again been blocked by legal proceedings, the Bangor & Portland Co. having obtained an injunction to restrain the new road from crossing its track.

**Wrightsville & Tennille.**—This road is now completed to Wrightsville, Ga., 16½ miles southward from the junction with the Central Railroad at Tennille, and regular trains are running over it. The road will be operated as a branch of the Central Railroad. An extension from Wrightsville to Dublin is proposed.